

COMPETENCY-BASED QUESTION BANK

WITH ANSWER KEY & STRUCTURED EXPLANATION

CLASS 12 BIOLOGY



FEATURES

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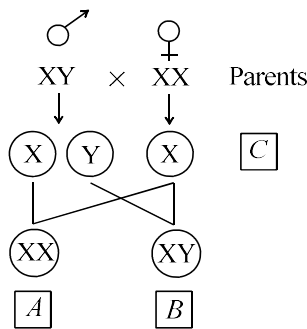
7 NCERT Integration

Questions and answers are based on the NCERT syllabus, ensuring relevance for both CBSE board exams and entrance tests.

4. PRINCIPLES OF INHERITANCE AND VARIATION

1. A haemophilic woman marries a normal man, then
 - a) All the children will be normal
 - b) All the sons will be haemophilic
 - c) All the girls will be haemophilic
 - d) Half girls will be haemophilic
2. Disorder inherited as Mendel's law of inheritance called
 - a) Mendelian disorder
 - b) Chromosomal disorder
 - c) Maternal inheritance
 - d) Polygenic inheritance
3. The term 'gene' was coined by
 - a) Avery
 - b) Bateson
 - c) Johanssen
 - d) Mendel
4. The phenotypic ratio in the F_2 generation of dihybrid cross, is
 - a) 9 : 3 : 3 : 1
 - b) 1 : 2 : 2 : 4 : 1 : 2 : 1 : 2 : 1
 - c) 7 : 1 : 1 : 7
 - d) 12 : 8 : 4
5. Chromosome is made up of
 - a) DNA + pectin
 - b) RNA + DNA
 - c) DNA + histone
 - d) Only histone
6. Select the incorrect statement from the following.
 - a) Linkage is an exception to the principle of independent assortment in heredity
 - b) Galactosemia is an inborn error of metabolism
 - c) Small population size result in random genetic drift in a population
 - d) Baldness is a sex-limited trait
7. A pure tall and a pure dwarf plant were crossed to produce offsprings. Offsprings were self crossed, then find out the ratio between true breeding tall to true breeding dwarf?
 - a) 1 : 1
 - b) 3 : 1
 - c) 2 : 1
 - d) 1 : 2 : 1
8. Exposure of X-rays enhances the frequency of
 - a) Linkage
 - b) Crossing over
 - c) Pairing of chromosome
 - d) Segregation
9. A self-fertilizing trihybrid plant forms
 - a) 8 different gametes and 64 different zygotes
 - b) 4 different gametes and 16 different zygotes
 - c) 8 different gametes and 16 different zygotes
 - d) 8 different gametes and 32 different zygotes
10. Genotype is the
 - a) Genetic constitution
 - b) Genetic constitution of the phenotype
 - c) Trait expressed
 - d) Expressed genes
11. Failure of cytokinesis after ...A... stage of cell division results in an increase in a whole set of chromosomes in an organism called ...B...
 - a) A-prophase, B-polyploidy
 - b) A-metaphase, B-polyploidy
 - c) A-anaphase, B-polyploidy
 - d) A-telophase, B-polyploidy
12. In previous question find out total seeds (plants) having round seed texture
 - a) 12
 - b) 10
 - c) 9
 - d) 11
13. The ratio 1 : 1 : 1 : 1 is obtained from a cross between the parents
 - a) RRYy × rryy
 - b) RRYy × rryy
 - c) RRYy × Rryy
 - d) RrYy × rryy
14. Which of the following terms represent a pair of contrasting characters?
 - a) Homozygous
 - b) Heterozygous
 - c) Allelomorphs
 - d) Codominant genes
15. Harmful mutation does not get eliminated from the gene pool because they are mainly
 - a) Dominant, which have beneficial effect on population and carried by heterozygous individuals
 - b) Dominant, which have beneficial effect on population and carried by homozygous individuals
 - c) Carried from one generation to another generation through autosomal chromosomes
 - d) They show genetic drift

16. Incomplete linkage is ...A... .Complete linkage is ...B... .Choose correct option for A and B
 a) A-common, B-rare
 b) A-rare, B-common
 c) A-impracticable, B-practicable
 d) A-practicable, B-impracticable
17. Mendelism was rediscovered by
 I. Morgan
 II. De Vries
 III. Correns
 IV. Tschermak
 Choose the correct option
 a) I, III and IV
 b) I, II, III and IV
 c) II, III and IV
 d) I, II and III
18. In gynandromorphs,
 a) Some cells of body contain XX and some cells with genotype XY
 b) All cells have XX genotype
 c) All cells have XY genotype
 d) All cells with genotype XXY
19. Example of intergenic gene interaction is/are
 a) Incomplete dominance
 b) Codominant
 c) Multiple alleles
 d) All of the above
20. If a cross between two individuals produces offspring with 50% dominant character (A) and 50% recessive character (a), then the genotypes of parents are
 a) Sex linked genes
 b) Pseudoallelic genes
 c) Intermediate inheritance
 d) Dominant and recessive genes
21. Which is correct about traits chosen by Mendel for his experiment on pea plant?
 a) Terminal pod was dominant
 b) Constricted pod was dominant
 c) Green coloured pod was dominant
 d) Tall plants were recessive
22. Codominance is found in
 a) Plants
 b) Animal
 c) Both (a) and (b)
 d) Prokaryote
23. During Mendel's investigation, it was first time that ...A... and ...B... were applied in biology. Here A and B refers to
 a) A-statistical analysis; B-mathematical logic
 b) A-statistical analysis; B-physical logic
 c) A-statistical analysis; B-chemistry logic
 d) A-statistical analysis; B-simple logic
24. The chromosomal denotation for heterogametic female and homogametic male are
 a) ZW and ZZ
 b) ZO-ZZ
 c) XX-XO
 d) Both (a) and (b)
25. Pure tall plants are crossed with pure dwarf plants. In the F_1 -generation, all plants were tall. These tall plants of F_1 -generation were selfed and the ratio of tall to dwarf plants obtained was 3: 1. This is called
 a) Dominance
 b) Inheritance
 c) Codominance
 d) heredity
26. The best method to determine the homozygosity and heterozygosity of an individual is
 a) Self-fertilisation
 b) Back cross
 c) Test cross
 d) Inbreeding
27. A medical technician, while observing a human blood smear under the microscope notes the presence of a Barr body close to the nuclear membrane in the WBC. This indicates that the person under investigation is a
 a) Colourblind
 b) Haemophilic
 c) Normal female
 d) Normal male
28. Find out A, B and C in the diagram given below in

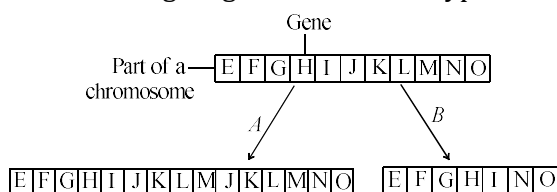


- a) A-Male, B-Female, C-Gametes
 c) A-Female, B-Male, C-Gametes
- b) A-Male, B-Female, C-Sperm
 d) A-Gametes, B-Male, C-Female
29. In Turner's syndrome
 a) Female is fertile b) Male is fertile c) Female is sterile d) Male is sterile
30. The most likely reason for the development of resistance against pesticides in insect damaging a crop is
 a) Random mutations b) Genetic recombination
 c) Directed mutations d) Acquired heritable changes
31. Lampbrush chromosomes are seen in
 a) Interphase b) Zygotene c) Diplotene d) metaphase
32. In case of incomplete dominance, what will be the phenotypic ratio of F_2 generation?
 a) Histones b) Hydrocarbons c) Polynucleotides d) Lipoproteins
33. Examples of dissimilar sex chromosomes are given below
 I. $XX - XY \Rightarrow I$
 II. $XX - XO \Rightarrow II$
 I and II in the above statement can be
- | I | II |
|------------------------|-----------------------------|
| a) Man and most insect | b) Cockroach and roundworms |
| c) Butterfly | d) Bird |
| | Reptiles |
34. Mutations, which alter nucleotide sequence within a gene are
 a) Frameshift mutation b) Base pair substitutions
 c) Both (a) and (b) d) None of these
35. The F_1 generation has all tall, and F_2 ratio is 3 : 1, it proves
 a) Law of dominance b) Independent assortment
 c) Law of segregation d) linkage
36. Mendel's law were true for situation in which
 a) Alleles are affected by their environment b) Alleles shows complete dominance
 c) Alleles of a gene alter the affect of a different gene d) A given character is determined by more than one gene
37. Blood group-O has
 a) No antibodies b) No antigens c) a or b antibodies d) A and B antigens
38. Wilson detected the colour blindness disease in
 a) 1921 b) 1911 c) 1912 d) 1910
39. In a dihybrid cross between RRYy and rryy parents, the number of RrYy genotypes in F_2 generation will be
 a) 4 b) 3 c) 2 d) 1
40. If a cross between two individuals produces offspring with 50% dominant character (A) and 50% recessive character (a), then the genotypes of parents are
 a) Genic interactions controlling a character b) Multiple genes controlling a character
 c) Expression of many characters by a single gene d) Alternative forms of a gene at a given locus
41. A woman with albinic father marries an albinic man. the proportion of her progeny is
 a) 2 normal : 1 albinic b) All normal
 c) All albinic d) 1 normal : 1 albinic

42. When one sex chromosome is lacking in female and males are homogametic, in that condition, the sex chromosomal representation is
 a) ZO-ZZ b) XY-XX c) XX-XO d) ZW-ZZ
43. Some individuals with blood group –A may inherit the genes for blonde hair, while other individuals with blood group – A may the gene for brown hair. This can be best explained by the principle of
 a) Dominance b) Multiple alleles
 c) Independent assortment d) Incomplete dominance
44. In bugs and cockroaches, the sex determination takes place by
 a) XX and XO chromosomes b) XX and XY chromosomes
 c) ZZ-ZW chromosomes d) ZO-ZZ chromosomes
45. The two ...A... separate and pass into two daughter nuclei and cells during mitosis. Similarly, each ...B... replicates, with one pair passing into each daughter cell during mitosis. This maintains the similar ...C... of all the cells.
 Find out correct option for A, B and C
 a) A-chromatid, B-allele pair, C-morphology b) A-chromatid, B-allele pair, C-genetic composition
 c) A-organ, B-organ pair, C-individuality d) A-unlinked gene, B-linked gene, C-morphology
46. The shape of chromosome is determined by
 a) Centrosome b) Centromere c) Chromomere d) telomere
47. Mendel was a
 a) Austrian biology teacher b) Austrian monk
 c) Austrian scientist d) Austrian mathematician
48. Who clearly proved and define linkage?
 a) Morgan b) Castle c) Bateson d) Punnett
49. Improvement of human race through hereditary qualities is called
 a) Euthenics b) Human heredity c) Human demography d) Eugenics
50. Test cross involves
 a) Crossing between two genotypes with recessive trait
 b) Crossing between two F_1 -hybrids
 c) Crossing the F_1 -hybrid with a double recessive genotype
 d) Crossing between two genotypes with dominant trait
51. When a diploid female plant is crossed with a tetraploid male, the ploidy of endosperm cells in the resulting seed is
 a) Tetraploidy b) Pentaploidy c) Diploidy d) Triploidy
52. Colour blindness is
 a) Sex-linked recessive disease
 b) Sex-linked dominant disease
 c) Autosomal dominant disease
 d) Autosomal recessive disease
53. A condition, where a certain gene is present in only a single copy in a diploid cell, is called
 a) Four different types of gametes produced by the F_1 -dihybrid b) Homozygous condition of the F_1 -dihybrid
 c) Four different types of F_1 -dihybrids d) Four different types of gametes produced by the P_1 -parent
54. If the blood group of a child is A and of mother is B, then the genotype of mother and father may be
 a) BB $\times$ AA b) AB $\times$ AB c) BO $\times$ OO d) BO $\times$ AO
55.  symbol in pedigree analysis represents
 a) Still birth b) Still death c) Still carrier d) Still mating
56. Which amino acids are present in histones?
 a) Lysine and histidine b) Valine and histidine
 c) Arginine and lysine d) Arginine and histidine

57. Monosomic trisomy are represented as
 a) $2n - 1 + 1$ b) $2n - 1 - 1$ c) $2n - 1$ d) $2n + 1 + 1$
58. Which is a sex-influenced disease?
 a) Baldness in male b) Haemophilia
 c) Xerodermapigmentosa d) Down's syndrome
59. Thalassaemia is
 a) Autosomal recessive disease b) Autosomal dominant disease
 c) Sex-linked dominant disease d) Sex-linked recessive disease
60. Mutation is phenomena which results in alternation of
 a) Sequence b) Carbohydrates c) Proteins d) Fat
61. A man with normal vision whose father was colourblind marries with women whose father was also colourblind. Suppose their first child is daughter then what are the chances of this child to be colourblind?
 a) 100% b) 25% c) 50% d) 0%
62. Gamete mother cells of the chromosome $44 + XY$ suffers from non-disjunction at first meiotic division. Which of the following set of gametes would result?
 a) $22 + XX$, $22 + XY$, and $22, 22$ b) $22 + XY$, $22 + XY$, and $22, 22$
 c) $22 + X$, $22 + Y$, and $22 + Y, 22$ d) $22 + X$, $22 + XY$, and $22 + Y, 22 + Y$
63. Law of Mendel, which is not completely applicable is?
 a) Codominance b) Law of segregation
 c) Law of independent assortment d) Law of dominance
64. Low pitched voice, bearded and moustaches, belong to the
 a) Sex limited traits b) Sex linked trait c) Nullisomic traits d) Sex influenced traits
65. Multiple allele can be manifested only when there is the study of
 a) Individual organism b) Genus c) Population d) Phylum
66. *Nicotiana sylvestris* flowers only during long days and *N. tabacum* flowers only during short days, if raised in the laboratory under different photoperiods, they can be induced to flower at the same time and can be cross fertilized to produce self-fertile offspring. What is the best reason for considering *N. sylvestris* and *N. tabacum* to be separate species?
 a) They are physiologically distinct b) They are morphologically distinct
 c) They cannot interbreed in nature d) They are reproductively distinct

67. The following diagram shows two types of chromosomal mutations



Give the name or type of mutation in respect to A and B

- a) A-Duplication, B-Substitution b) A-Duplication, B-Deletion
 c) A-Inversion, B-Deletion d) A-Inversion, B-Substitution
68. How many different kinds of gametes will be produced by a plant having the genotype $AABbCC$?
 a) Three b) Four c) Nine d) Two
69. Down's syndrome and Turner's syndrome occur in human beings due to
 a) Monosomic and nullisomic conditions respectively b) Monosomic and trisomic conditions respectively
 c) Trisomic and monosomic conditions respectively d) Trisomic and tetrasomic conditions respectively
70. What are all the chances of colourblind daughters of a normal man marrying normal women whose father was colourblind?
 a) All sons are normal and all daughters are colourblind b) Both the sons and daughters are phenotypically normal
 c) All the sons are colourblind and all daughters are d) 50% sons are colourblind and all daughters are

phenotypically normal

71. In males, pattern baldness is related to both autosomal genes as well as excessive secretion of
a) Oestrogen b) Growth hormone c) Testosterone d) Inhibits

72. Which of these is not a Mendelian disorder?
a) Cystic fibrosis b) Sickle-cell anaemia c) Colourblindness d) Turner's syndrome

73. Which of the following is not true of haemophilia?
a) Royal disease b) Bleeder's disease
c) X-linked disorder d) Y-linked disorder

74. If heterozygous dominant (tT) crossed with homozygous dwarf plant, then the percentage of progeny having dwarf character is
a) 60% b) 40% c) 50% d) 70%

75. Mutations are generally induced by means of
a) α - rays b) β - rays c) γ - rays d) UV radiations

76. Two crosses between the same pair of genotypes or phenotypes, in which the sources of the gametes are reversed in one cross, is known as
a) Dihybrid cross b) Reverse cross c) Test cross d) Reciprocal cross

77. A hereditary, disease, which is never passed on from father to son is
a) X-chromosomal linked disease b) Autosomal linked disease
c) Y-chromosomal linked disease d) None of the above

78. Bateson used the term coupling and repulsion for linkage and crossing over. Choice the correct coupling and repulsion combination

Coupling	Repulsion				
a) <table border="1" style="display: inline-table; border-collapse: collapse;"><tr><td>AABB, aabb</td><td>AAbb, aaBB</td></tr></table>	AABB, aabb	AAbb, aaBB	b) <table border="1" style="display: inline-table; border-collapse: collapse;"><tr><td>AABB, aabb</td><td>AABB, AAbb</td></tr></table>	AABB, aabb	AABB, AAbb
AABB, aabb	AAbb, aaBB				
AABB, aabb	AABB, AAbb				
c) <table border="1" style="display: inline-table; border-collapse: collapse;"><tr><td>AAbb, aaBB</td><td>AaBb, aabb</td></tr></table>	AAbb, aaBB	AaBb, aabb	d) <table border="1" style="display: inline-table; border-collapse: collapse;"><tr><td>aaBB, aabb</td><td>AABB, aabb</td></tr></table>	aaBB, aabb	AABB, aabb
AAbb, aaBB	AaBb, aabb				
aaBB, aabb	AABB, aabb				

79. In blood group typing in human, if an allele contributed by one parent is I^A and an allele contributed by the other parent is i , the resulting blood group of the offspring will be
a) A b) B c) AB d) O

80. A person having 45 chromosomes and Y-chromosome absent. Is suffering from
a) Down's syndrome b) Klinefelter's syndrome
c) Turner's syndrome d) gynandromorph

81. Linkage and crossing over are
a) Same phenomena b) Different phenomena
c) Opposite phenomena d) Identical phenomena

82. The modern concept of gene is
a) A segment of DNA, capable of crossing over b) Functional unit of DNA
c) A segment of RNA d) A segment of chromosome

83. Females in haplodiploidy sex determination are
a) N b) $2n$ c) $\frac{1}{2}n$ d) $3n$

84. Using imprints from a plate with complete medium and carrying bacterial colonies, you can select streptomycin resistant mutants and prove that such mutations do not originate as adaptation. These imprints need to be used
a) Only on plates with streptomycin b) On plates with minimal medium
c) Only on plates without streptomycin d) On plates with and without streptomycin

85. Phenylketonuria, Huntington's disease and sickle cell anaemia are caused respectively due to disorders associated with
a) Chromosome-7, chromosome-11 and chromosome-12
b) Chromosome-11, Chromosome-4 chromosome-12
c) Chromosome-7, chromosome-12 and chromosome-11
d) Chromosome-12, chromosome-4 and chromosome-11

86. The arrangement of genes on chromosome is

- a) Linear b) Ovoid c) Diffused d) Spiral
87. When two genetic loci produce identical phenotypes in *cis* and *trans* position, they are considered to be
a) Pseudoalleles b) Multiple alleles
c) The part of same gene d) Different genes
88. Which of the following matches correctly?
a) Factor –II - Thromboplastin b) Factor –III - Prothrombin
c) Factor –VIII - Antihaemophilic globulin d) Factor –XII - Haemophilic
89. The longest chromosomes is seen in
a) *Allium* b) *Lilium* c) *Trillium* d) *Zeamays*
90. Mendel observed that generation shows always phenotype of dominant parent
a) F_4 b) F_2 c) F_1 d) F_0
91. ...A... genes are those which occurs on the same chromosome and ...B... genes are those, which are present on different chromosome.
Choose correct choice for A and B
a) A-linked; B-unlinked gene b) A-unlinked; B-linked
c) A-identical; B-non-identical d) A-non-identical; B-identical
92. Allelic sequence variations where more than one variant (allele) at a locus in a human population with a frequency greater than 0.01 is referred to as
a) Incomplete dominance b) Multiple allelism
c) SNP d) DNA polymorphism
93. The possibility of a female becoming a haemophilia is ...A... rare because mother of such a female has to be at least ...B... and the father should be ...C...
Choose the correct option for A, B and C
a) A-extremely, B-carrier, C-haemophilic
b) A-extremely, B-carrier, C-carrier
c) A-extremely, B-haemophilic, C-carrier
d) A-extremely, B-haemophilic, C-haemophilic
94. If the foetus is Rh^+ and mother is Rh^- , then
a) Foetus will transmit antigen to mother blood
b) Foetus will transmit antibody to mother blood
c) Foetus is attacked by antibodies to mother blood
d) Foetus is attacked by antigen to mother blood
95. The most popularly known blood grouping is the ABO grouping. It is named ABO and not ABC, because 'O' in it refers to having
a) Other antigens besides A and B on RBCs b) Over dominance of this type on the genes for A and B types
c) One antibody only—either anti-a or anti-b on the RBCs d) No antigens A and B on RBCs
96. Alleles are
a) Alternate forms of a gene b) Homologous chromosome
c) Pair of sex chromosome d) None of the above
97. Telomere repetitive DNA sequences control the function of eukaryotic chromosomes because they
a) Act as replicons b) Are RNA transcription initiator
c) Help chromosome pairing d) Prevent chromosome loss
98. Genotypic and phenotypic ratios remains the same in
a) Sex-linked genes b) Pseudoallelic genes
c) Intermediate inheritance d) Dominance and recessive genes
99. Mendelian disorder may be of
a) Recessive b) Dominant c) Both (a) and (b) d) Can't be determined
100. Sickle –cell anaemia has not been eliminated from the African population because it
a) Is controlled by recessive genes b) Is not a fatal disease

c) Provides immunity against malaria

d) Is controlled by dominant genes

101. A condition characterized by not having an exact number of chromosomes in a multiple of haploid set is called

a) Polyploidy

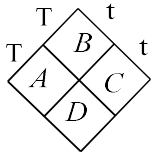
b) Synploidy

c) aneuploidy

d) None of these

102. Choose correct option for A, B, C and D

TT × Tt



a) A-tt, B-TT, C-TT, D-TT

b) A-Tt, B-Tt, C-Tt, D-Tt

c) A-TT, B-TT, C-Tt, D-TT

d) A-Tt, B-Tt, C-Tt, D-TT

103. When a cross is conducted between black feathered hen and a white feathered cock, blue feathered fowls are formed. When these fowls are allowed for interbreeding, in F_2 - generation, there are 20 blue fowls. What would be the number of black and white fowls?

a) Black 20, white 10

b) Black 20, white 20

c) Black 10, white 10

d) Black 10, white 20

104. Chromosomes are made up of

a) DNA are protein

b) RNA and DNA

c) DNA and histone

d) Only histones

105. In pedigree analysis, the square, blackened and horizontal lines represents

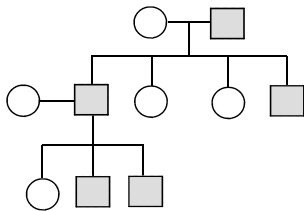
a) Female, healthy individual, parents

b) Female, affected individual, parents

c) Male, affected individual, parents

d) Male, affected individual, progeny

106. Following pedigree chart shows



a) Character is carried by Y-chromosome

b) Character is sex-linked recessive

c) Character is sex-linked dominant

d) Character is recessive autosomal

107. Mr. Sidd is suffering from hypertrichosis and phenylketonuria. His father is heterozygous for phenylketonuria. The probability of Sidd's sperm having one recessive autosomal allele and holandric gene is

a) $\frac{1}{2}$

b) $\frac{1}{8}$

c) $\frac{1}{10}$

d) $\frac{1}{4}$

108. F_3 -generation is obtained by

a) Selfing of F_1

b) Selfing of F_2

c) Crossing of F_1 and F_2

d) None of these

109. In which one of the following, complementary gene interaction ratio of 9 : 7 is observed?

a) Fruit shape in Shepherd's purse

b) Coat colour in mouse

c) Feather colour in fowl

d) Flower colour in pea

110. Starch synthesis gene in pea plant is the example of

a) Single gene produce more than one effects

b) Multiple genes produce more than one effects

c) Two genes produce more than one effects

d) Multiple genes produce less than one effects

111. In *Drosophila*, the sex is determined by

a) The ratio of pairs of X-chromosomes to the pairs of autosomes

b) Whether the egg is fertilized or develops parthenogenetically

c) The ratio of number of X-chromosomes to the set of autosomes

d) X and Y-chromosomes

112. The 1 : 2 : 1 ratio with the pink flower in the F_2 -generation indicate the phenomenon of

- a) Dominance
- b) Codominance
- c) Incomplete dominance
- d) Segregation

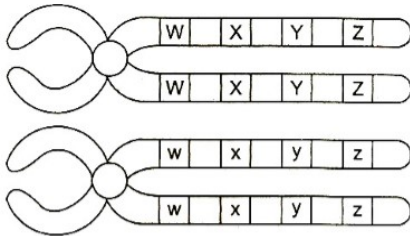
113. Sexual reproduction leads to

- a) Genetic recombination
- b) Polyploidy
- c) Aneuploidy
- d) Euploidy

114. Husband has blood group-A and wife has blood group-B. What is the blood group of children?

- a) A
- b) B
- c) AB
- d) A, B, AB and O

115. Study the following figure and find out the most probable position at which the crossing over takes place



- a) w and W
- b) X and y
- c) y and Z
- d) w and z

116. Given diagram shows certain type of traits in human. Which one of the following option could be an example of this pattern?



- a) Haemophilia
- b) Anaemia
- c) Phenylketonuria
- d) Thalassemia

117. In case of incomplete dominance, what will be the phenotypic ratio of F_2 generation?

- a) 3 : 1
- b) 1 : 2 : 1
- c) 1 : 1 : 1 : 1
- d) 2 : 2

118. Haemophilia, a X-linked recessive disease is caused due to deficiency of

- a) Blood plasma and vitamin-K
- b) Blood platelets and haemoglobin
- c) Lack of clotting material and vitamin-K
- d) All of the above

119. All of this obeys Mendel's laws except

- a) Codominance
- b) Independent assortment
- c) Dominance
- d) Purity of gametes

120. In β -thalassaemia, the affected chromosome is

- a) 16th
- b) 14th
- c) 13th
- d) 19th

121. In pea plants, yellow seeds are dominant to green. If a heterozygous yellow seeded plant is crossed with a green seeded plant, what ratio of yellow and green seeded plants would you expect in F_1 generation?

- a) 50 : 50
- b) 9 : 1
- c) 1 : 3
- d) 3 : 1

122. Who was fly men of genetics?

- a) Sutton
- b) Pasteur
- c) Robert Hooke
- d) TH Morgan

123. Mendel's contribution for genetic inheritance was

- a) The idea that genes are found on chromosomes
- b) Providing a mechanism that explains patterns of inheritance
- c) Describing how genes are influenced by the environment
- d) Determining that the information contained in DNA codes for proteins

124. The genotypic ratio of a monohybrid cross in F_2 -generation is

- a) 3 : 1
- b) 1 : 2 : 1
- c) 2 : 1 : 1
- d) 9 : 3 : 3 : 1

125. Baldness is more common in men than in woman. It could be explained on the basis that

- a) Genes of baldness are located on X-chromosomes only
- b) Baldness genes are located on Y-chromosomes

- c) Genes of baldness are autosomal but influenced by androgens
d) None of the above
126. How many pairs of contrasting characters in pea pod were chosen by Mendel?
a) 3 b) 5 c) 7 d) 9
127. A mutagen pollutant is
a) Organophosphates b) Resins
c) Chlorinated hydrocarbons d) Nitrogen oxides
128. Both chromosome and gene (Mendelian factors) whether dominant or recessive are transmitted from generation to generation in which form
a) Changed b) Unaltered form c) Altered form d) Disintegrated
129. Pedigree analysis is very important in human beings because
a) It helps genetic counselors to avoid disorders
b) It shows origin of traits
c) It shows the flow of traits in family
d) All of the above
130. Genes when present in homozygous condition results in non – viable progeny, the factor responsible for such conditions are
a) Polygenes b) Linked genes c) Lethal genes d) Epistatic genes
131. Turner's syndrome caused due to the absence of
a) One X-chromosome (44 with XO) b) One Y-chromosome
c) One X-and Y-chromosome d) Two X-chromosome
132. The recessive genes located on X-chromosome in humans are always
a) Lethal b) Sub-lethal c) Expressed in males d) Expressed in females
133. Strength of the linkage between the two genes is
a) Proportionate to the distance between them
b) Inversely proportionate to the distance between them
c) Depend on the chromosomes
d) Depend upon the size of chromosomes
134. Fruitfly is excellent model for genetics because of
I. Small life cycle (two week)
II. Can be feed on simple synthesis medium
III. Single mating produce large number of progeny
IV. Clear differentiation of sexes
V. Many heredity variation can be seen with low power microscopes
Choose the correct option
a) I, II and III b) III, IV and V c) I, IV and V d) All of these
135. In Guinea pigs, black short hair (BBSS) is dominant over white long hair (bbss). During a dihybrid cross, the F_2 -generation individuals with genotypes BBSS, BbSS, BBss and Bbss are in the ratio of
a) 9 : 3 : 3 : 1 b) 4 : 2 : 1 : 2 c) 1 : 2 : 1 : 2 d) 1 : 2 : 2 : 4
136. When both parents are of blood type AB, they can have children with
a) A, B, AB and O blood types b) A, B, and AB blood types
c) A and B blood types d) A, B and O blood types
137. Test cross is
a) Recessive F_1 -plant crosses with dominant F_2 -plant
b) Recessive F_2 -plant crosses with dominant F_3 -plant
c) Dominant F_2 -plant crosses with recessive parent plants
d) Dominant F_2 -plant crosses with heterozygous parent plants
138. The phenomenon of a single gene regulating several phenotypes is called
a) Multiple allelism b) epistasis
c) Incomplete dominance d) Pleiotropism
139. If two pea plants having red (dominant) coloured flowers with unknown genotypes are crossed, 75% of the flowers with unknown genotypes are crossed, 75% of the flowers are red and 25% are white. The

a) Both homozygous
b) One homozygous and other heterozygous
c) Both heterozygous
d) Both hemizygous

140. A woman has a haemophilic son and three normal children. Her genotype and that of her husband with respect to this gene would be
a) XX and X^{hY} b) X^hX^h and X^hY c) X^hX^h and XY d) X^hX and XY
141. The proportion of plants that were dwarf and tall in F_2 - generation of Mendel experiment
a) $\frac{1}{4}$ th and $\frac{3}{4}$ th b) $\frac{3}{4}$ th and $\frac{1}{4}$ th c) $\frac{2}{3}$ rd and $\frac{1}{3}$ rd d) $\frac{1}{3}$ rd and $\frac{4}{3}$ rd
142. Night blindness is
a) Genetic disease b) Nutritional deficiency disease
c) Generally found in male d) Generally found in female
143. Two genes R and Y are located very close on the chromosomal linkage map of maize plant. When RRYy and rryy genotypes are hybridized, then F_2 -segregation will show
a) 1 : 2 : 1 b) 3 : 1 c) 9 : 3 : 3 : 1 d) 1 : 1 : 1
144. Who argued that pairing and separation of chromosomes would lead to the segregation of a pair of factors they carried?
a) Sutton b) Boveri c) Both (a) and (b) d) Morgan
145. Sex chromosomes of male are
a) Homozygous b) Heterozygous c) Hemizygous d) autosomes
146. Trisomy of which chromosome is involved in Down's syndrome?
a) 15th b) 21st c) 20th d) 19th
147. Which of the following symbols are used for representing chromosome of birds?
a) ZZ-ZW b) XX-XY c) XO-XX d) ZZ-WW
148. Sudden and heritable change in a character of an organism is called
a) Mutation b) Heterosis c) Inbreeding d) selection
149. Heterozygous purple flower is crossed with recessive white flower. The progeny has the ratio
a) All purple b) All white
c) 50% purple, 50% white d) 75% purple, 25% white
150. The Mendel crossed true breeding tall and dwarf plant varieties in his experiment. The tall character was dominant and recessive character was dwarf. The recessive character was appeared in
a) F_1 b) F_2 c) F_3 d) F_2 and F_3
151. Night blindness can be corrected by giving vitamin- ...A... but colour blindness can't be cured because it is ...B... disease.
Choose the correct option for A and B
a) A-A; B-genetic b) A-B; B-autosomal c) A-C; B-non-genetic d) A-D; B-genetic
152. Heredity is
a) Transmission of characters b) Mixing of characters
c) Blending of inheritance d) Deleting of characters
153. Which of these statements about Huntington's disease is true?
a) Genetic tests to detect the presence of the allele responsible for Huntington's disease do not exist at this time
b) The onset of Huntington's disease is typically between birth and three years of age
c) There is currently no effective treatment of Huntington's disease
d) Huntington's disease is caused by the expression of a recessive allele
154. Centromere is required for
a) Transcription b) Crossing over
c) Cytoplasmic cleavage d) Movement of chromosomes towards poles
155. Which of the following condition in humans is correctly matched with its chromosomal abnormality/linkage?

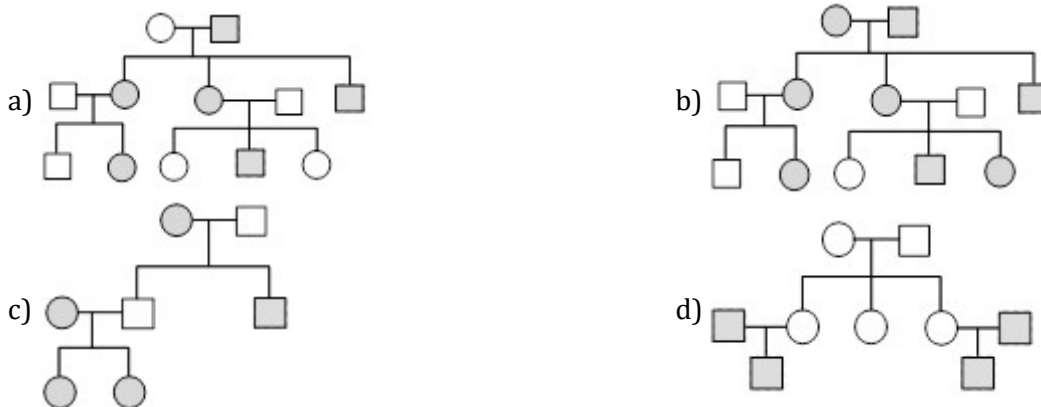
- a) Klinefelter's syndrome -44 autosomes + XXY b) Colour blindness -Y- linked
c) Erythroblastosis foetalis -X- linked d) Down's syndrome - 44 autosomes+ XO
156. Rrrr progeny : Red (dominant) flowered heterozygous crossed with white flower
a) 350 → red : 350 → white b) 450 → red : 250 → white
c) 380 → red : 250 → white d) None of these
157. A hereditary disease which is never passed on from father to son is
a) X- chromosomal linked disease b) Autosomal linked disease
c) Y- chromosomal linked disease d) None of the above
158. A man with blood group-B marries a woman with blood-A and their first child is having blood group-B. What is the genotype of child?
a) $I^a I^b$ b) $I^a I^o$ c) $I^b I^o$ d) $I^b I^b$
159. Linked genes are present on
a) Same chromosome b) Different chromosome
c) Heterologous chromosome d) Paired chromosome
160. The structure that becomes double in synthesis phase of cell division is/are
a) RNA b) Centriole c) DNA d) None of these
161. Genetics is the branch of biology which deals with
a) Variation b) Inheritance c) Both (a) and (b) d) Study of characters
162. Giant chromosomes are found inside
a) nucleus of man b) oocytes of frog
c) salivary glands of silk moth d) salivary glands of *Drosophila*
163. Who is known as father of physiological genetics or father of biochemical genetics?
a) Slatyer b) Charles Elton c) Taylor d) Archibald Garrod
164. The graphical representation to calculate the probability of all possible genotypes of offspring in a genetic cross, is called
a) Pedigree analysis b) Karyotype c) Punnett square d) Chromosome map
165. Rh factor can produce disease
a) AIDS b) Turner's syndrome
c) Erythroblastosis foetalis d) Sickle-cell anaemia
166. To determine heterozygosity of a cross, one has to perform
a) Back cross b) Reciprocal cross c) Test cross d) Any of these
167. Which of the following type of mutation involves the reverse order of genes in a chromosome?
a) Deletion b) Duplication
c) Inversion d) Reciprocal translocation
168. The chromosomal number in the meiocytes of housefly is
a) 8 b) 12 c) 21 d) 23
169. The alternate forms of a gene are called
a) Recessive character b) Dominant character
c) Alleles d) Alternative gene
170. Haemophilia is related to
a) Albinism b) Sickle-cell anaemia c) Colour blindness d) thalassemia
171. Identify a Mendelian disorder from the following.
a) Down's syndrome b) Turner's syndrome
c) Phenylketonuria d) Klinefelter's syndrome
172. When a tall plant with round seeds (TTRR) crossed with a dwarf plant with wrinkled seeds (ttrr), the F_1 -generation consists of tall plants with round seeds. What would be the proportion of dwarf plant with wrinkled seeds in F_1 -generation?
a) $\frac{1}{4}$ b) $\frac{1}{16}$ c) 0 d) $\frac{1}{2}$

173. The term 'Genetics' was proposed by
 a) Mendel b) Bateson c) Motgan d) Johanssen

174. Sex chromosomes are also known as
 a) Autosomes b) Allosomes c) Genome d) karyotype

175. Mendel obtained recessive character in F_2 by ...A... the ...B... plants. Here A and B refers to
 a) A-self-pollinating; B- F_1 b) A-self-pollinating; B- F_2
 c) A-cross-pollinating; B- F_1 d) A-cross-pollinating; B- F_2

176. In a family father had a trait but mother did not. All their sons and daughter had this trait. The same trait was found in some grand daughters, through daughter were married to the normal persons. Choose the correct pedigree chart for the condition



177. If genes of an allelic pair are not-same. This condition is called
 a) Homozygous b) Heterozygous c) Diallelic d) Polyallelic

178. Which type of pollination method was adopted by Mendel in his experiment?
 a) Artificial b) Cross pollination c) Natural d) Both (a) and (b)

179. Select the correct statement from the ones given below with respect to dihybrid cross.
 a) Tightly linked genes on the same chromosome show higher recombinations b) Genes far apart on the same chromosome show very few recombinations
 c) Genes loosely linked on the same chromosome show similar recombinations as the tightly linked ones d) Tightly linked genes on the same chromosome show very few recombinations

180. Grain colour in wheat is determined by three pairs of polygene. Following the cross $AABBCC$ (dark colour) $\times$ $aabbcc$ (light colour) , in F_2 generation. What proportion of the progeny is likely to resemble either parent?
 a) Half b) Less than 5 per cent c) One -third d) None of these

181. Chromosomal abbreviation commonly found in the
 a) Cancer cells b) Normal cells c) Healthy cells d) Autosomal cells

182. In short horned cattle, genes for red(R) and white(r) coat colour occur. Cross between red (RR) and white (rr) produced (Rr) roan. This is an example of
 a) Incomplete dominance b) Codominance
 c) Complementary genes d) Epistasis

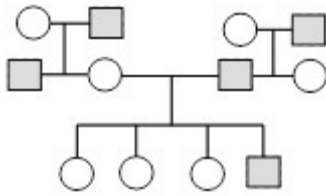
183. Female is haemophilic definitely if
 a) Mother is carrier b) Father is carrier
 c) Father is affected d) Both mother and father affected

184. Polyploidy leads to rapid formation of new species because of
 a) Isolation b) Development of multiple sets of chromosomes
 c) Mutation d) Genetic recombination

185. Law of segregation is also called law of
 a) Probability b) Purity of gametes
 c) Independence of gametes d) Punnett hypothesis

186. Test cross is a cross between

- a) Hybrid $\times$ Dominant parent b) Hybrid $\times$ Recessive parent
c) Hybrid $\times$ Hybrid parent d) Two distantly related species
187. XX and XY chromosomal sex determination, females are
a) Homogametic b) Heterogametic
c) Can not determine d) All of the above
188. Heterogametic male condition does not occur in
a) Birds b) Humans c) *Drosophila* d) Honey bee
189. In a typical Mendelian cross which is a dihybrid cross, one parent is homozygous for both dominant traits and another parent is homozygous for both recessive traits. In the F_2 generation, both parental combinations and recombinations appear. The phenotypic ratio of parental combinations to recombinations, is
a) 10:6 b) 12:4 c) 9:7 d) 15:1
190. The genotype of a plant showing the dominant phenotype can be by
a) Test cross b) Dihybrid cross c) Pedigree analysis d) Back cross
191. If a man who is colourblind marries a woman, who is pure normal for colour vision, the chances of their sons have colour blindness is
a) 100% b) 50:50 c) 0% d) 75 : 25
192. When a tall pea plant (TT) is crossed with dwarf plant (tt) what will be the F_2 -generation?
a) All tall plants b) All dwarf plants
c) Both tall and dwarf plants in 1 : 1 ratio d) Both tall and dwarf plants in 3 : 1 ratio
193. Broadly the genetic disorders may be classified in ...A... group Mendelian disorder and ...B... disorders. Mendelian disorder are mainly determined by ...C... in single gene.
Choose the correct option for A, B and C
a) A-two, B-chromosomal, C-genetic b) A-two, B-chromosomal, C-inversion
c) A-two, B-chromosomal, C-alteration d) A-three, B-chromosomal, C-deficiency
194. ...A... individual show ...B... phenotype but they are the ...C... of the disease as there is 50% probability of transmission of mutant gene to its progeny
Choose the correct option for A, B and C
a) A-homozygous, B-affected, C-carrier b) A-homozygous, B-unaffected, C-carrier
c) A-heterozygous, B-unaffected, C-carrier d) A-heterozygous, B-affected, C-carrier
195. If male is TT and female is tt then they contribute pollen and egg respectively with
a) T and T gametes b) tt and TT gametes c) TT and tt gametes d) T and t gametes
196. Number of linkage group in *Pisum sativum*
a) 2 b) 5 c) 7 d) 9
197. In Mendel's experiments with garden pea, round seed shape (RR) was dominant over wrinkled seeds (rr), yellow cotyledon (YY) was dominant over green cotyledon (yy). What are the expected phenotypes in the F_2 - generation of the cross $RRYY \times rryy$?
a) Only round seeds with green cotyledons b) Only wrinkled seeds with yellow cotyledons
c) Only wrinkled seeds with green cotyledons d) Round seeds with yellow cotyledons and wrinkled seeds with yellow cotyledons
198. BB = for black colour alleles
bb = for brown colour alleles
Offspring of a cross between a black mouse and brown mouse allowed to interbreed then find out the percentage of black coat in them
a) 75%
b) 50%
c) Cross is not possible because black and brown mouse are different species
d) 100%
199. Given pedigree chart indicates



- a) Autosomal recessive trait b) Y-linkage trait
c) Autosomal dominant trait d) Sex linkage recessive trait
200. The mutant haemoglobin molecule undergoes polymerization under low oxygen tension causing the change in the shape of RBC from biconcave to elongated structure. This property of RBC is found in
a) Haemophilia b) Colour blindness c) Phenylketonuria d) B-thalassaemia
201. XO type of sex determination is seen in
a) Man b) Grasshopper c) *Drosophila* d) Birds
202. TtRr represents (heterozygous tall, heterozygous pink). If this plant is self crossed then (T-dominant, t-recessive, R-dominant, r-recessive)
I. 25% plant have red flower
II. 25% plant have white flower
III. 50% plant have pink flower
IV. 50% plant are tall
Choose the correct option
a) I and II b) I, II and III c) II, III and IV d) I, II, III and IV
203. Chimera is produced due to
a) Somatic mutations b) Reverse mutations
c) Lethal mutations d) Pleiotropic mutations
204. How many pairs of true breeding varieties were selected by Mendel for his experiment on pea plant
a) 12 b) 13 c) 7 d) 15
205. Syndrome stands for
a) A group of symptoms b) Viral disease
c) Diseased condition d) Dwarf organism
206. Parents with blood group-A and AB will not produce offspring with blood group
a) A b) AB c) B d) O
207. The genetic deficiency of ADH-receptor leads to
a) Diabetes mellitus b) Glycosuria
c) Diabetes insipidus d) Nephrogenic diabetes
208. Which of the following observation made Mendel in refutation of the blending theory of inheritance?
a) Red plant crossed with white-the resulting progeny was pink
b) Features of offspring are not intermediate
c) Gametes carrying different type of alleles could not fuse successfully
d) After meiosis, two copies of given gene end up in the same gamete
209. Mutations are generally
a) Recessive b) Polymorphic c) Lethal d) dominant
210. The 'Cri-du-chat' syndrome is caused by the change in chromosome structure involving
a) Deletion b) Duplication c) Inversion d) translocation
211. Pedigree analysis indicated that Mendel's principal are also applicable to ...A... genetics with some modifications find out like ...B... inheritance, sex linked inheritance and others.
Choose the correct option for A and B
a) A-animal; B-quantitative b) A-human; B-qualitative
c) A-human; B-quantitative d) A-animal; B-qualitative
212. Which one of the following traits of garden pea studied by Mendel was a recessive feature?
a) Green pod colour b) Round seed colour c) Axial flower position d) Green seed colour
213. Genes for cytoplasmic male sterility in plants are generally located in

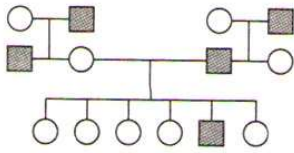
- a) Mitochondrial genome b) Cytosol
c) Chloroplast genome d) Nuclear genome
214. A distinct mechanism that usually involves a short segment of DNA with remarkable capacity to move from one location in a chromosome to another is called
a) DNA replication b) DNA hybridization c) DNA recombination d) DNA transposition
215. When F_1 -generation progeny resembles both the parents this is called
a) Condominance b) Incomplete dominance
c) Both (a) and (b) d) Complete dominance
216. The individual from which a pedigree analysis initiated is called
a) Probend b) Propositus c) Both (a) and (b) d) Origin
217. Plant which used by Hugo de Vries for mutation experiment was
a) *Oenothera lamarckiana* b) *Solanum tuberosum*
c) *Ficus elastica* d) None of the above
218. A person is suffering from disease phenylketonuria, which is an autosomal recessive disease. Which of these is lacking in the person?
a) Homogentisic acid b) Phenylalanine hydroxylase
c) Caeruloplasmin d) Cystine
219. Haemophilia in man is due to
a) Sex-linked inheritance b) Sex-limited inheritance
c) Sex-influenced inheritance d) Primary non-disjunction
220. When a dihybrid cross is fit into a Punnett square with 16 boxes, the maximum number of different phenotypes available, are
a) 8 b) 4 c) 2 d) 16
221. $2n-2$ is known as
a) Monosomic b) Trisomic c) Nullisomy d) Polyploidy
222. A man and a woman, who do not show any apparent sign of a certain inherited disease, have seven children (two daughter and five sons). Three of the sons suffer from the given disease but none of the daughters are affected. Which of the following mode of inheritance do you suggest for this disease?
a) Autosomal dominant b) Sex -linked dominant
c) Sex -limited recessive d) Sex -linked recessive
223. Colourblindness is caused due to
a) Recessive female chromosome b) Dominant female chromosome
c) Dominant male chromosome d) linkage
224. Which principle/law has been called the 2nd law of inheritance?
a) Law of independent assortment b) Law of segregation
c) Law of dominance d) Law of paired factor
225. Mendel's experiment were based on hybridization between two plants differing in
a) A pair of contrasting character
b) Three pairs of contrasting character
c) Many pairs of contrasting character
d) None of the above
226. Alleles can be similar as in the case of ...A... like ...B... or can be dissimilar as in the case of ...C... like ...D...
Choose the correct option for A,B,C and D
a) A-heterozygous, B-TT or T t, C-homozygous, D-TT
b) A-homozygous, B-TT or tt, C-heterozygous, D-Tt
c) A- homozygous, B-T t, C- heterozygous, D-TT
d) A- homozygous, B-T t, C- heterozygous, D-tt
227. The Barr body is observed in
a) Basophils of male b) Neutrophils of female
c) Basophils of female d) Eosinophils
228. The phenotypic ratio of a monohybrid cross in F_2 -generation is

- a) 3 : 1 b) 1 : 2 : 1 c) 2 : 1 : 1 d) 9 : 3 : 3 : 1

229. Total number of wrinkled seed in previous question

- a) 4 b) 3 c) 2 d) 1

230. This pedigree is of a rare trait, in which children have extra fingers and toes. Which one of the following patterns of inheritance is consistent with this pedigree?



- a) Autosomal recessive b) Autosomal dominant
c) Y-linkage d) Sex -linked recessive

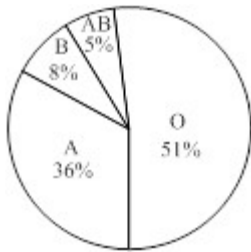
231. If a colourblind woman marries a normal visioned man, their sons will be

- a) All normal visioned
b) One half colourblind and one half normal
c) Three-fourth colourblind and one-fourth normal
d) All colourblind

232. Barr body is produced due to partial inactivation of one X-chromosome in female. This is called

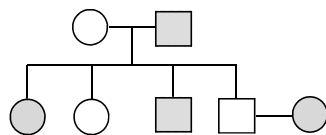
- a) Dosage compensation b) Facultative heterochromatization
c) Both (a) and (b) d) None of the above

233. Percentage of blood groups in India is given in the diagram below. Choose the correct option from the given statements



- a) Only 10% of individuals are heterozygous for blood group alleles
b) Group A is the most common as it is the homozygous recessive group
c) The alleles for blood group A and O are dominant to the allele for blood group O
d) Any individual, selected at random from the sample population, has a 1 in 20 chance of being blood group AB

234. find out the genotype of father and mother is the given pedigree chart



	Mother	Father
a)	AA	AA
c)	AA	aa

b)	Aa	Aa
d)	aa	Aa

235. Analysis of traits of several generation of a family in the form of diagram is called

- a) Gene analysis b) Chromosome analysis
c) Allele analysis d) Pedigree analysis

236. Among the following which one is the mutagenic agent?

- a) Visible light b) Penicillin c) Formalin d) Water vapour

237. Frameshift mutation and base pair substitution changes the

- a) Nucleotide structure b) Nucleotide sequence
c) Nucleoside sequence d) Sugar phosphate sequence

238. A woman with blood-O has a child with blood group-O. She claims that a man with blood group-A is the

father of her child. What would be the genotype of the father, if her claim is right?

- a) $I^O I^O$ b) $I^A I^B$ c) $I^A I^O$ d) $I^B I^O$

239. The terminal end of chromosomes is called

- a) Centromere b) Telomere c) Chromomere d) metamere

240. Mendel conducted experiments for

- a) 7 years b) 6 years c) 5 years d) 4 years

241. Cross between unrelated group of organisms, is called

- a) Hybridization b) Test cross c) Back cross d) heterosis

242. If $AAbb \times aaBB$, then phenotypic ratio of its progeny will be

- a) 9 : 3 : 3 : 1 b) 1 : 2 : 1 c) 1 : 1 : 1 : 1 d) 4 : 1

243. I. Short statured with small round head

II. Furrowed tongue and partially opened mouth

III. Palm is broad with characteristic palm crease

IV. Slow physical, psychomotor and mental development

These are the characters of

- a) Down's syndrome b) Turner's syndrome
c) Klinefelter's syndrome d) Edward syndrome

244. Which of the following statements are false?

I. A Dominant allele determines the phenotype when paired with a recessive allele

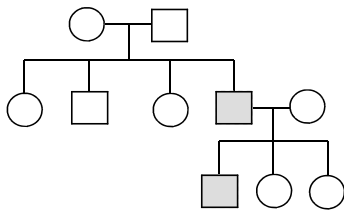
II. A recessive allele is weaker than a dominant allele

III. A recessive allele does not show its effects when paired with a dominant allele

IV. A dominant allele is always better for an organism

- a) II, I and IV b) II, III and IV c) I, II and III d) I, III and IV

245. Following pedigree chart shows



- a) Recessive and autosomal
b) Recessive and sex-linked
c) Dominant and sex-linked
d) Dominant and autosomal

246. Phenotype of an organism is the result of

- a) Mutations and linkages b) Cytoplasmic effects and nutrition
c) Environmental changes and sexual dimorphism d) Genotype and environment interactions

247. Which of the following is not a hereditary disease?

- a) Cretinism b) Cystic fibrosis c) Thalassemia d) Haemophilia

248. F_1 - progeny of a cross between pure tall and dwarf plant is always

- a) Tall b) Short c) Intermediate d) None of these

249. Gynaecomastia is a common feature seen in

- a) Down's syndrome b) Turner's syndrome
c) PKU d) Klinefelter's syndrome

250. Dominant lethal gene is one which

- a) Allows the organism to survive but not reproduce b) Determines sex of offsprings
c) Allows the organism to survive and reproduce d) Kills the organism

251. Total number of round seed in a cross between pure yellow round and pure green wrinkled seeds in F_2 is (out of total 16 resulted)

- a) 9 b) 12 c) 11 d) 10

252. Linked gene is related to ...A... and unlinked gene is related to ...B...

Choose correct option for A and B

- a) A-linkage; B-crossing over
- b) A-crossing over; B-linkage
- c) A-crossing over; B-recombination
- d) A-recombination; B-crossing gene

253. The linkage map of X-chromosomes of fruit fly has 66 units, with yellow body gene (y) at one end and bobbed hair (b) gene at the other end. The recombination frequency between these two genes (y and b) should be

- a) $\leq 50\%$
- b) 100%
- c) 66%
- d) $>50\%$

254. In man, which of the following genotypes and phenotypes may be the correct result of aneuploidy in sex chromosomes?

- a) 22 pairs+XXY males
- b) 22 pairs+XXfemales
- c) 22 pairs+XXXYfemales
- d) 22 pairs+Xfemales

255. Experimental evidence of chromosomal theory of inheritance was given by

- a) HT Morgan
- b) TH Morgan
- c) H de Vries
- d) DH Vries

256. Theoretically in incomplete dominance one allele function as normal, while another allele may function as

- a) Normal allele
- b) Non-functional allele
- c) Normal but less efficient allele
- d) All of the above

257. In a family, man have blood group-A and women have blood group-B. Blood group of their children will be

- a) Only A
- b) A or B or AB or O
- c) Only O
- d) Only B

258. Principle or laws of inheritance were enunciated by

- a) Mendel
- b) Morgan
- c) Bateson
- d) Punnett

259. Mendel's law was explained by

- a) Meiosis
- b) Mitosis
- c) Both (a) and (b)
- d) None of these

260. Which statement about Mendel is true?

- a) His discoveries concerning genetic inheritance were generally accepted by scientific community at his time
- b) He discovered linkage
- c) He believed that genetic traits of parents will usually blend in their children
- d) His principles about genetics apply usually to plants and animals

261. The loss of chromosomal segment is due to

- a) Polyploidy
- b) Deletions
- c) Duplications
- d) Inversions

262. Symbol A, B and C indicates



- a) Carrier female
- b) Effected female
- c) Death of female
- d) Normal female

263. The chromosomal condition in Turner's syndrome is

- a) 21 trisomy with XY
- b) 44 autosomes + XXY
- c) 44 autosomes + XYY
- d) 18 trisomy with XY

264. If a child is of O blood group and his father is of B blood group, the genotype of father is

- a) $I^O I^O$
- b) $I^A I^B$
- c) $I^O I^B$
- d) $I^O I^A$

265. Work of Beadle and Tatum on *Neurospora crassa* proved that

- a) Complementary genes
- b) Blending inheritance
- c) Multiple alleles
- d) psedoalleles

266. The F_2 -generation offspring in a plant showing incomplete dominance, exhibit

- a) Variable genotypic and phenotypic ratio
- b) a genotypic ratio of 1 : 1
- c) a phenotypic ratio of 3 : 1
- d) Similar genotypic and phenotypic ratio of 1 : 2 : 1

267. Cytoplasmic inheritance always shows

- a) Paternal characters
c) Parental characters

b) Maternal characters
d) Little paternal and more maternal characters

268. Type of gamete participating in selfing of members in monohybrid cross are of
a) One type
b) Two type
c) Four type
d) Many type

269. In sickle-cell anaemia, GAG is replaced by
a) GGA
b) GUG
c) AAG
d) GGG

270. Genes, when close together on a chromosome, are known as
a) Linkage
b) Mutation
c) Translation
d) transscription

271. If a character is always transmitted directly from a father to all his sons and from their sons to all their sons, then which chromosome carries the gene for the character?
a) Autosome
b) X-chromosome
c) Y-chromosome
d) None of these

272. Hugo de Vries is famous for
a) Natural selection theory
c) Organic theory
b) Mutation theory
d) Chemical theory

273. Jumping genes in maize were discovered by
a) Hugo de Vries
b) Barbara McClintock
c) T H Morgan
d) Mendel

274. A plant of F_1 - generation has genotype 'AABbCC'. On selfing of this plant, the phenotypic ratio in F_2 - generation will be
a) 3 : 1
c) 9 : 3 : 3 : 1
b) 1 : 1
d) 27 : 9 : 9 : 9 : 3 : 3 : 3 : 1

275. The character that is expressed in the F_1 -generation is called the
a) Recessive character
c) Codominant character
b) Dominant character
d) None of these

276. Chromosomal theory of inheritance was proposed by
a) Gregor Mendel
b) Hugo de Vries
c) Bridges
d) Sutton and Boveri

277. In sex linkage, the speciality is
a) Atavism
c) Reversion
b) Criss-cross inheritance
d) Gene flow

278. Mother = A blood group
Father = AB blood group
The child will not have
a) A blood group
b) O blood group
c) B blood group
d) A blood group

279. The chromosome constitution $2n-2$ of an organism represents
a) Monosomic
b) Nullisomic
c) Haploid
d) trisomic

280. Phenylalanine does not changed to tyrosine. This condition is seen in
a) Sickle-cell anaemia
c) Thalassaemia
b) Phenylketonuria
d) Haemophilia

281. When the chromosome number of a given organism has one additional chromosome in one of the homologous pairs, the addition is known as
a) Trisomy
b) Monosomy
c) Polyploidy
d) nullisomy

282. What type of gametes will form by genotype rr Yy?
a) ry, rY
b) RY, Ry
c) Ry, Yy
d) RR, Yy

283. The term 'genetics' was introduced in
a) 1906
b) 1905
c) 1904
d) 1903

284. Mutant genes that give slightly modified phenotypes are
a) Heteroalleles
b) Recessive alleles
c) Isoalleles
d) Dominant alleles

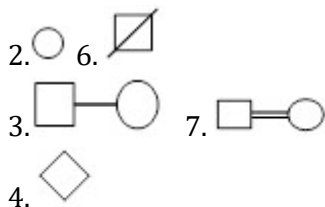
285. Which of the following is an example of sex-linked disease?
a) AIDS
b) Colour blindness
c) Syphilis
d) Gonorrhoea

286. Mutations can be induced with
a) IAA
b) Ethylene
c) Gamma radiations
d) Infra red radiations

287. Which of the following is an inherited disorder?

- a) Leprosy b) Goitre c) AIDS d) Albinism
288. The title of Mendel's paper, while presenting at Brunn Natural History Society in 1865 was
a) Laws of inheritance b) Laws of heredity
c) Experiments on pea plants d) Experiments on plant hybridisation
289. XO chromosomal abnormality in humans causes
a) Turner's syndrome b) Down's syndrome
c) Darwin's syndrome d) Klinefelter's syndrome
290. Milk secretion and baldness, both the traits belongs to
a) Sex limited b) Sex linked c) Sex influenced d) Autosomal traits
291. The daughter born to haemophilic father and normal mother could be
a) normal b) Carrier c) Haemophilic d) None of these
292. Blood grouping is the example of
a) Multiple allele b) Condominance
c) Both (a) and (b) d) Independent assortment
293. A true breeding plant producing red flowers is crossed with a pure plant producing white flowers. Allele for red colour of flower is dominant. After selfing the plants of first filial generation, the proportion of plants producing white flowers in the progeny would be
a) $\frac{3}{4}$ b) $\frac{1}{4}$ c) $\frac{1}{3}$ d) $\frac{1}{2}$
294. ...A... is sex linked recessive disease. Which shows its transmission from ...B... female to ...C... progeny. Choose the correct option for A, B and C
a) A-haemophilia, B-carrier, C-male b) A-cystic fibrosis, B-carrier, C-male
c) A-sickle-cell anaemia, B-carrier, C-male d) A-phenylketonuria, B-carrier, C-male
295. Crossing over is advantageous because it brings about
a) Variation b) Linkage c) Inbreeding d) Stability
296. Father of 'genetics' is
a) De Vries b) Mendel c) Bateson d) Robert Hooke
297. The recessive gene that always produces its effect, is
a) Pleiotropic gene b) Complementary gene
c) Holandric gene d) Supplementary gene
298. When different alleles of the same gene are present on an individual, the individual is a
a) Heterozygous b) Diploid c) Homozygous d) mosaic
299. Sex linked traits are the traits determined by
a) Sex chromosome b) Autosomes c) Allosomes d) All of these
300. Number of Barr body in XXXY is
a) 1 b) 2 c) 3 d) 4
301. 21 trisomy in humans causes
a) Klinefelter's syndrome b) Down's syndrome
c) Turner's syndrome d) Patau's syndrome
302. Paternal baldness, moustaches and beard in human males are example of
a) Sex differentiating traits b) Sex determining traits
c) Sex-linked traits d) Sex-influenced traits
303. Polytene chromosomes in salivary glands of *Drosophila* are formed as a result of
a) Endoduplication b) Duplication without separation
c) Replication of DNA without cell division d) All of the above
304. A normal women whose father was colourblind, is married to a normal man. The sons would be
a) 75% colourblind b) 50% colourblind c) All normal d) All colourblind
305. Match the symbols with statement

1. ☐ 5. ☐



- A. Diseased (death)
 B. Carrier (female) of X-linked recessive gene
 C. Marriage in blood relatives
 D. Unknown sex

Codes

A B C D

a) 1 2 3 4

b) 6 5 7 4

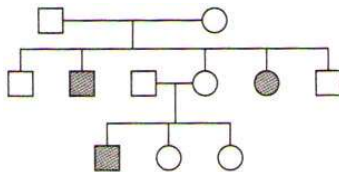
c) 2 1 3 4

d) 6 2 3 4

- 306.** The female children of haemophilic father and carrier mother are
 a) All haemophilic b) Half haemophilic, half carrier
 c) All normal d) All carrier
- 307.** Genetic counsellors can identify heterozygous individuals by
 a) Height of individuals b) Colour of individuals
 c) Screening procedures d) All of these
- 308.** How many conditions exhibit in dissimilar sex chromosomes?
 a) 2 b) 3 c) 4 d) 5
- 309.** Number of chromosomes in Down's syndrome are
 a) 46 b) 47 c) 48 d) 49
- 310.** Which phenomena leads to the variation in DNA
 a) Mutation b) Linkage c) Both (a) and (b) d) Mitosis
- 311.** External morphology or appearance or descriptive term of an genotype is called
 a) Genotype b) Phenotype c) Both (a) and (b) d) None of these
- 312.** In which of the following, there is no defect in the sex chromosome?
 a) Turner's syndrome b) Down's syndrome
 c) Colour blindness d) Klinefelter's syndrome
- 313.** The traits which are not expressed due to a particular gene but are expressed by products of sex hormones are
 a) Sex influenced traits b) Autosomal traits c) Allosomic traits d) Sex linked traits
- 314.** Choose the correct option for the chromosomal disorders
 I. Colour blindness
 II. Down's syndrome
 III. Phenylketoria
 IV. Turner's syndrome
 V. Thalassaemia
 a) I, II and III b) II, IV and V c) III, IV and V d) II and IV
- 315.** First time who used the term frequency of recombination?
 a) Alfred Sturtevant b) Alfred Nobel c) Pasteur d) Mendel
- 316.** Who postulated the mutation theory?
 a) Mendel b) Darwin c) Lamarck d) Hugo de Vries
- 317.** Choose the chemical used in artificial polyploidy
 a) Polyethylene glycol b) Sodium alginate
 c) Acenaphthene d) Sodium hypochlorite
- 318.** Linkage groups are always present on the
 a) Homologous chromosomes
 b) Analogous chromosomes

- c) Sex chromosomes
- d) Heterologous chromosomes

319. Sex determination in an organism is given by $\frac{X}{A} = 1.5$, then organism will be
- a) Male
 - b) Female
 - c) Super female
 - d) Intersex
320. Emasculation is the removal of
- a) Flower buds
 - b) Anthers before dehiscence
 - c) Carpels before dehiscence
 - d) Mature flowers
321. The genes, which remain confined to differential region of Y-chromosome, are
- a) Autosomal genes
 - b) Holandric genes
 - c) Sex-linked genes
 - d) Mutant genes
322. Study the pedigree chart given below.



What does it show?

- a) Inheritance of a sex-linked inborn error of metabolism like phenylketonuria
 - b) Inheritance of a condition like phenylketonuria as an autosomal recessive trait
 - c) The pedigree chart is wrong as this is not possible
 - d) Inheritance of a recessive sex-linked disease like haemophilia
323. Mutation cannot change
- a) RNA
 - b) Environment
 - c) Enzyme
 - d) DNA
324. One of the parents of a cross has mutation in its mitochondria. In that cross, that parent is taken as a male. During segregation of F_2 -progenies that mutation is found in
- a) One-third of the progenies
 - b) None of the progenies
 - c) All of the progenies
 - d) Fifty per cent of the progenies
325. Mendel does not get linkage due to
- a) Dominance
 - b) Independent assortment
 - c) Segregation
 - d) Genes on same chromosome
326. Frameshift mutation arises due to
- a) Deletion of base pair of DNA
 - b) Insertion of base pair of DNA
 - c) Both (a) and (b)
 - d) Change in single base pair of DNA
327. Genes A, B and C are linked. Genes A and B are more close than A and C. Find out the correct option for the given statements
- I. A might be before B and C
 - II. B might be between A and C
 - III. C might be between A and B
 - IV. More crosses has occurred between A and C than A and B
- a) I and II
 - b) II and III
 - c) III and IV
 - d) I, II and IV
328. In previous question find out the ratio between round and wrinkled seed texture
- a) 3 : 1
 - b) 2 : 2
 - c) 1 : 1
 - d) 9 : 6 : 1
329. Which of the following blood groups' person can not donate blood to other?
- a) AB blood group
 - b) O blood group
 - c) A blood group
 - d) B blood group
330. Which of the following is not related to sex chromosome X or Y?
- a) Turner's syndrome
 - b) Klinefelter's syndrome
 - c) Down's syndrome
 - d) Haemophilia and colourblindness
331. Inheritance of characters not located in the gene but the young one resembling only the female part is due to
- a) Cytoplasmic inheritance
 - b) Chromosomal inheritance
 - c) Plastid inheritance
 - d) epigenesis
332. Mendel found the phenotype of the F_1 heterozygote Tt was to be exactly like the ...A...parent in

appearance, he proposed that in a pair of dissimilar factors, one dominates the other (as in the F_1) and hence is called the ...B... factor, while the other factor is ...C...

Choose the correct option for A,B and C

- a) A-TT, B-dominant, C-recessive
b) A-Tt, B-dominant, C-recessive
c) A-t t, B-dominant, C-recessive
d) A-Tt, B-Recessive, C-dominant

333. Which of the following pairs of features is a good example of polygenic inheritance?

- a) Human height and skin colour
b) ABO blood groups in humans and flower colour of *Mirabilis jalapa*
c) Hair pigment of mouse and tongue rolling in humans
d) Humans eye colour and sickle cell anaemia

334. Find the phenotype of A, B, C, D from given cross (R-Red and r = white)

- a) A-Red, B-Red, C-Red, D-White
b) A-Red, B-Red, C-White, D-White
c) A-Pink, B-Red, C-White, D-White
d) A-Pink, B-Red, C-Red, D-White

335. Incomplete dominance is shown by

- a) Primrose
b) *Mirabilis*
c) *Helianthus*
d) China rose

336. Which of the following genes show the heterozygous condition?

- a) Rr
b) RR
c) Rr
d) None of these

337. Rrrr (progeny): Red (dominant) flowers (heterozygous) were crossed with white flower. The result will be

- a) 350 → Red : 350 → white
b) 450 → Red : 250 → white
c) 380 → Red : 320 → white
d) None of the above

338. A common test to find the genotype of a hybrid is by

- a) Crossing of one F_2 -progeny with male parent
b) Crossing of one F_2 -progeny with female parent
c) Studying the sexual behaviour of F_1 -progenies
d) Crossing of one F_1 -progeny with male parent

339. Which of the following has the least number of chromosomes?

- a) *Amoeba*
b) *Drosophila*
c) *Pheretima*
d) *Ascarismegalocephala*

340. In given genetic basis of human blood group table find out which belongs to blood group A, B, AB and O

S.no.	Allele from Parent 1	Allele from Parent 2	Genotype of Offspring s
I.	I^A	I^A	$I^A I^A$
II.	I^A	I^B	$I^A I^B$
III.	I^A	i	$I^A i$
IV.	I^B	I^A	$I^A I^B$
V.	I^B	I^B	$I^B I^B$
VI.	I^B	i	$I^B i$
VII.	i	i	ii

A	B	AB	O
a) I,III	V,VI	II,IV	VII
c) VII	II,IV	V,VI	I,II

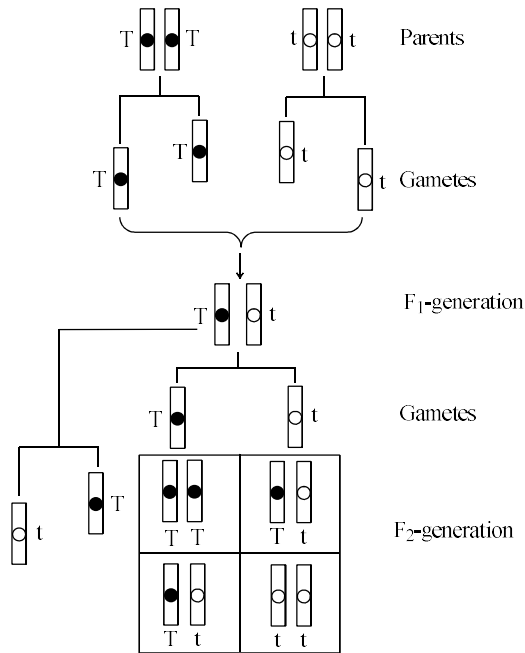
b) I,IV	VI,II	II,III	V
d) I,III	II,IV	V,VI	VII

341. The chemical nature of chromatin is as follows

- a) Nucleic acids
b) Nucleic acid and histone proteins

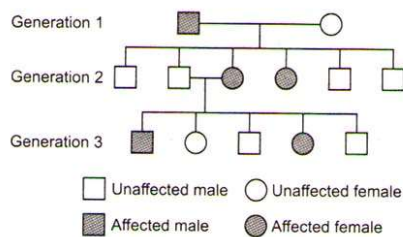
- c) Nucleic acids, histone and non-histone proteins
d) Nucleic acids and non-histone proteins

342. What does this diagram indicate?



- a) Law of dominance interpreted on basis of genes
b) Law of segregation interpreted on basis of genes
c) Law of independent assortment interpreted on basis of genes
d) Simply gamete genes

343. Given below is a pedigree chart showing the inheritance of a certain sex- linked trait in humans.



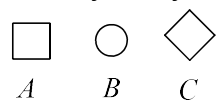
The trait traced in the above pedigree chart is

- a) Dominant X-linked b) Recessive X-linked c) Dominant Y-linked d) Recessive Y-linked

344. Mendel observed that certain character did not assort independently. Later, scientist found that this is due to

- a) Linkage in traits b) Crossing over
c) Both (a) and (b) d) Dominance of one trait over the other

345. Identify the symbols given below and the correct option with respect to A, B and C



- a) A-Male, B-Female, C-Sex unspecified
b) A-Male, B-Female, C-Sterile
c) A-Male, B-Female, C-Fertile
d) A-Female, B-Male, C-Sex unspecified

346. Mendel investigated characters in garden pea plant that were manifested in two trait

- a) Similar b) Non-zygote c) Identical d) Opposite

347. Phenylketonuria disease is a

- a) Autosomal dominant b) Autosomal recessive
c) Sex linked recessive d) Sex linked dominant

348. The literal meaning of chromosome is

- a) Painted body b) Coloured body c) Doubling body d) Thread like body

349. The F₂ genotypic ratio of monohybrid cross is

- a) 1 : 1 b) 1 : 2 : 1 c) 2 : 1 : 2 d) 9 : 3 : 3 : 1

350. The offspring produced from a marriage have only O or A blood groups. Which of the following genotypes would be, the possible genotypes of the parents?

- a) $I^A I^A$ and $I^A I^O$ b) $I^O I^O$ and $I^O I^O$ c) $I^A I^A$ and $I^A I^O$ d) $I^A I^O$ and $I^A I^O$

351. In order to find out the different types of gametes produced by a pea plant having the genotype AaBb, it should be crossed to a plant with the genotype

- a) aaBB b) AaBb c) AABB d) aabb

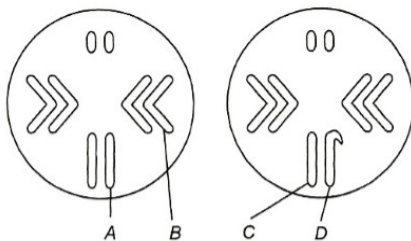
352. The lowest number of chromosomes is found, in which of the following?

- a) *Haplopappusgracilis* b) *Psalidoptera* c) *Salix tetrasperma* d) *Ageratum coigzoides*

353. The genes for seven characters of pea plant that were considered in Mendel hybridisation experiment are present on

- a) 4 chromosome b) 5 chromosome c) 7 chromosome d) 8 chromosome

354. Chromosome diagram of the given fruitfly tick the correct choice for autosome labelled

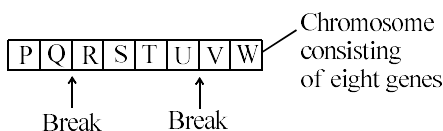


- a) A b) C c) D d) B

355. Identify the wrong statement.

- a) In male grasshoppers, 50% of the sperms have no sex chromosome
b) Usually, female birds produce two types of gametes based on sex chromosome
c) The human males have one of their sex chromosomes much shorter than other
d) In domesticated fowls, the sex of the progeny depends on the type of sperm rather than the egg

356. The chromosome shown in the diagram below is broken at the points which are indicated by the arrows and the genes between these points became inverted



The resulting order of the genes will be

- a) PQUTSRVW b) WVUTSRQP c) PQTURSVW d) VWUTSRPQ

357. Which of these is a dominant factor?

- a) Rh factor b) Haemophilia c) Albinism d) Colour blindness

358. A person with unknown blood group under ABO system, has suffered much blood loss in an accident and needs immediate blood transfusion. His one friend who has a valid certificate of his own blood type, offers for blood donation without delay. What would have been the type of blood group of the donor friend?

- a) Type AB b) Type O c) Type A d) Type B

359. If Mendel had studied 7 traits using a plant of 12 chromosomes instead of 14

Choose the correct option for probable result

- a) He would have discovered crossing over
b) He would have discovered blending
c) He would have not discovered independent assortment
d) All of the above

360. In thalassaemia, the affected chain of a haemoglobin is

- a) α -globin chain b) β -globin chain c) Both (a) and (b) d) None of these

361. Sex chromosomes in male of silkworm is

- a) X b) Y c) XX d) No X no Y

362. A hereditary disease, which is never passed on from father to son is

- a) Autosomal linked disease
- b) X-chromosomal linked disease
- c) Y-chromosomal linked disease
- d) None of the above

363. Two genes R and Y are located very close on the chromosomal linkage map of maize plant. When RRYy and rryy genotypes are hybridized, then F_2 -segregation will show

- a) Higher number of the recombinant types
- b) Segregation in the expected 9 : 3 : 3 : 1 ratio
- c) Segregation in 3 : 1 ratio
- d) Higher number of the parental types

364. During ...A... both members of chromosome pair as well as ...B... separate and pass to different gametes.

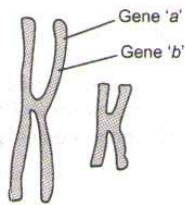
Choose the correct option for A and B

- a) A-mitosis; B-allele pair
- b) A-meiosis; B-allele pair
- c) A-allele pair; B-meiosis
- d) A-allele pair; B-mitosis

365. Genetic map is one that

- a) Shows the stages during the cell division
- b) Shows the distribution of various species in a region
- c) Establishes sites of the genes on a chromosome
- d) Establishes the various stages in gene evolution

366. Given below is a highly simplified representation of the human sex chromosomes from a karyotype. The gene 'a' and 'b' could be of



- a) Colour blindness and body height
- b) Attached ear lobe and rhesus blood group
- c) Haemophilia and red-green colour blindness
- d) Phenylketonuria and haemophilia

367. Human females have

- a) 22 pairs of autosomes and one pair of sex chromosome
- b) 21 pairs of autosomes and two pairs of sex chromosome
- c) 23 pairs of autosomes and one pair of sex chromosome
- d) 20 pairs of autosomes and one pair of sex chromosome

368. The progenies are found to be male sterile after crossing two plants. This is due to some genes, which are present in

- a) Mitochondria
- b) Cytoplasm
- c) Nucleus
- d) chloroplast

369. Mutation may result in the

- a) Change in genotype
- b) Change in phenotype
- c) Change in metabolism
- d) All of these

370. In cross between yellow round (YYRR) and pure breeding pea plants having green wrinkled (yyrr) find out the total seeds (plants) having yellow colour in F_2 -generation

- a) 12
- b) 10
- c) 14
- d) 11

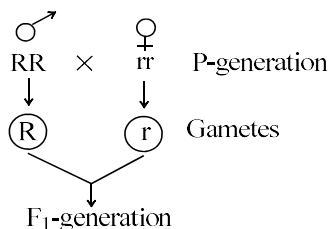
371. A cross in which parents differ in a single pair of contrasting character is called

- a) Monohybrid cross
- b) Dihybrid cross
- c) Trihybrid cross
- d) Tetrahybrid cross

372. Calvin bridges demonstrated sex determining factor is the ratio of number of

- a) X-chromosome to autosome
- b) Autosome to X-chromosome
- c) Y-chromosome to X-chromosome
- d) Y-chromosome to autosome

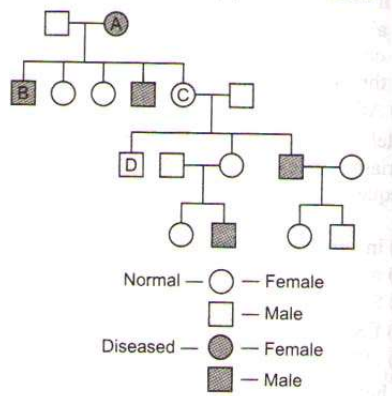
373. Find out the genotype and phenotype of F_1 -generation (R = dominant and red, r = recessive and white) from the given cross



- a) Rr and white b) Rr and red c) Rr and pink d) Can not predict
374. Which one of the following conditions correctly describes the manner of determining the sex in the given example?
- XO type of sex chromosomes determine male sex in grasshopper
 - XO condition in humans as found in Turner's syndrome, determines female sex
 - Homozygous sex chromosomes (XX) produce male in *Drosophila*
 - Homozygous sex chromosomes, (ZZ) determine female sex in birds.
375. Ratio observed in dihybrid cross (phenotypically)
- 3 : 1
 - 1 : 2 : 1
 - 9 : 7
 - 9 : 3 : 3 : 1
376. Trisomy stands for
- $2n - 1$
 - $2n + 2$
 - $2n + 3$
 - $2n + 1$
377. Klinefelter's syndrome results from
- XX egg of Y sperm
 - XX egg and XY sperm
 - X egg and YY sperm
 - XY egg and X sperm
378. A couple whose sons are colourblind with AB blood group, identify the parents from the following.
- Mother colourblind with A blood group, and father normal with blood group-B
 - Mother normal with blood group-A, and father colourblind with blood group-B
 - Mother colourblind with blood group-B, and father normal with blood group-B
 - Mother normal with blood group-A, and father colourblind with blood group-B
379. Which of the following chromosomal mutation are most likely to take place when homologous chromosomes are undergoing synapsis?
- Inversion and translocation
 - Deletion and duplication
 - Inversion and deletion
 - Translocation and duplication
380. What percentage of homozygous Rh⁻ will be born amongst four children of a couple where the husband is heterozygous for Rh⁺ and wife is homozygous for Rh⁻ gene?
- 25%
 - 50%
 - 75%
 - 100%
381. Mendel could not find out linkage because
- some genes are linked but they are too far apart for crossing over to be distinguished from independent assortment
 - linked genes, were never tested for the same time in same cross
 - all seven genes, were present on the same chromosomes
 - all seven genes were present on 4 chromosome but they were present far apart
- Find out the correct option
- I and II
 - II and III
 - III and IV
 - IV only
382. Haemophilia is also called
- Bleeders disease
 - Blood disease
 - RBC disease
 - All of these
383. The genes located in the same chromosome do not separate and are inherited together over its generations due to the phenomenon of
- Complete linkage
 - Incomplete linkage
 - Incomplete recombination
 - Complete recombination
384. Universal donor is
- O Rh⁺
 - O Rh⁻
 - AB Rh⁺
 - AB Rh⁻
385. Persons with Klinefelter's syndrome have chromosomes
- XX
 - XY
 - XXY
 - YYY

386. Mendel crossed tall and dwarf plant. In F_2 -generation both the tall and dwarf plants were produced. This shows
- Blending of characters
 - Atavism
 - Non-blending of characters
 - Intermediate characters
387. Sex- limited and sex- linked genes are located on
- Autosomes
 - X-chromosome
 - Y-chromosome
 - Both (b) and (c)
388. How many different types of gametes can be formed by F_1 progeny, resulting from the following cross?
 $AA\ BB\ CC \times aa\ bb\ cc$
- 3
 - 8
 - 27
 - 64
389. Point mutation involves
- Insertion
 - Change in single base pair
 - Duplication
 - deletion
390. A person with type A blood group may safely receive a transfusion of
- Type-AB
 - Type-A and type -O
 - Type-A and type -AB
 - Type-AB and type -O
391. In which cross will you get most pink flowers?
- Red $\times$ red
 - Red $\times$ pink
 - Pink $\times$ pink
 - Red $\times$ white
392. *Triticale* has been produced by the intergenic hybridization of
- Wheat and rice
 - Wheat and rye
 - Wheat and aegilops
 - Rice and maize
393. Which one of the following characters studied by Mendel in garden pea was found to be dominant?
- Green seed colour
 - Terminal flower position
 - Green pod colour
 - Wrinkled seed
394. Mendel's experimental material was
- Pisum sativum*
 - Lathyrus odoratus*
 - Oryza sativa*
 - Mirabilis jalappa*
395. Which of the following is not considered as mutagen?
- Lower temperature
 - X-rays
 - Higher temperature
 - UV rays
396. The physical expression or appearance of a character is called as
- Morphology
 - Genotype
 - Phenotype
 - Ecotype
397. Carrier organism refers to an individual, which carries a
- Dominant gene, that is not expressed
 - Recessive gene, that is not expressed
 - Recessive gene, that is expressed
 - Dominant gene, that is expressed
398. In previous question, find out which alphabete (A-D) labelled for X and Y-chromosome
- | | |
|--------|---|
| X | Y |
| a) A | D |
| b) A,C | D |
| c) C | D |
| d) B | D |
399. In amniocentesis of a pregnant woman, it is found that the embryo contains both, Barr body and F-body. The syndrome likely to be associated with the embryo is
- Edward' syndrome
 - Down's syndrome
 - Klinefelter's syndrome
 - Patau's syndrome
400. In the previous question, find out the chances of fifth child to be albino
- 1 in 2
 - 1 in 4
 - 1 in 3
 - 1 in 5
401. Three children in a family have blood types O, AB and B respectively. What are the genotypes of their parents?
- $I^A i$ and $I^B i$
 - $I^A I^B$ and $i i$
 - $I^B I^B$ and $I^A I^A$
 - $I^A I^A$ and $I^B i$
402. The chromosomal arrangement results in
- Euploidy
 - Aneuploidy
 - Duplication
 - polyploidy

403.



In the above pedigree, assume that no outsider marrying in, carry a disease. Write the genotypes of C and D.

- a) X^CY and X^CX^C b) XX^C and XY c) XY and X^CX^C d) X^CX^C and X^CX

404. The specific pair of chromosomes which determine the sex of the individual called

- a) Sex chromosomes b) Allosomes c) Heterosomes d) All of these

405. The 'Cri-du-chat' syndrome is caused by change in chromosome structure involving

- a) Deletion b) Duplication c) Inversion d) translocation

406. During his experiments, Mendel used the term factor for

- a) Genes b) Traits c) Characters d) Qualities

407. In a monohybrid cross involving incomplete dominance, the phenotypic ratio equals the genotypic ratio in F_2 - generation. The ratio is

- a) 3 : 1 b) 1 : 2 : 1 c) 1 : 1 : 1 : 1 d) 9 : 7

408. The genome of *Caenorhabditiselegans* consists of

- a) 3 million base pairs and 30,000 genes b) 180 million base pairs and 13,000 genes
c) 4.7 million base pairs and 4,000 genes d) 97 million base pairs and 18,000 genes

409. Albinism is caused by the deficiency of

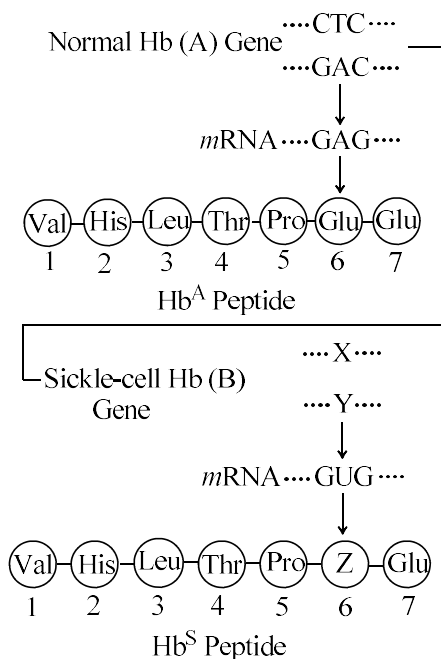
- a) Amylase b) Tyrosinase c) Phenylalanine d) Xantheneoxidase

410. The ABO blood grouping in human beings is an example for

- I. Dominance
II. Incomplete dominance
III. Codominance
IV. Multiple alleles

- a) I and II b) II, III and IV c) I, III and IV d) III and II

411. Sickle-cell anaemia is an autosomal linked recessive trait can be transmitted from parents to the offspring when both the partners are carrier for all the genes or heterozygous. The disease is controlled by a single pair of allele, Hb^A and Hb^S . Identify X, Y and Z



a) GTG GAC Val (GUG)

c) GTA GAG val (GUG)

b) CAC CTC val (GUG)

d) GTC GAC val (GUG)

412. Diploid cells have

a) Two chromosomes

c) Two pairs of homologous chromosomes

b) One set of chromosomes

d) Two sets of chromosomes

413. Single gene can produce more than one effect. Like starch synthesis in pea plant. It has two alleles (B and b) for starch synthesis the phenotypes of which are also given below

B B, b b, B b

I. BB – round seed, large starch synthesis

II. bb – wrinkle seed, less starch synthesis

III. Bb – intermediate size seed, intermediate less starch synthesis

Choose the correct option

a) I and II

b) II and III

c) III and I

d) I, II and III

414. After examining the blood groups of husband and wife, the doctor advised them not to have more than one child, the blood group of the couple are likely to be

a) male Rh⁻ and female Rh⁺

c) Male and female Rh⁺

b) Female Rh⁻ and male Rh⁺

d) Male and female Rh⁻

415. A person with blood group-A has

a) Antigen-A and antibody-b

c) Both antibodies

b) Antigen-B and antibody-a

d) No antibody and no antigen

416. Which of the following is not a correct match?

a) Sex determination

b) Y-chromosome

c) Red-green colour blindness in human

d) An abnormal chromosome number in each cell

– A chromosomal phenomenon

– Autosomal

– A sex-linked character

– A case of polyploidy

417. In law of independent assortment. How many factors are involved? (for a dihybrid cross)

a) 2

b) 3

c) 4

d) 1

418. Mother B homozygous, father A unknown, therefore, possible blood group in progeny is

a) AB and B possible

b) AB and A possible

c) A and B possible

d) O possible

419. Consider the following four statements I, II, III and IV and select the correct statements

I. Mendelian experiments has a large sampling size, which gave greater credibility to the data that he collected

II. Recessive allele influences the appearance of the phenotype even in the presence of a dominant allele

III. Multiple alleles can be found only when population studies are made

IV. In F_2 -generation of a Mendelian monohybrid cross, the tall and dwarf traits were identical to their parental types and shows blending inheritance

The correct statements are

- a) I and III b) III and IV c) II and IV d) II and III

420. When released from ovary, human egg contain

- a) One Y-chromosome b) Two X-chromosome c) One X-chromosome d) XY-chromosome

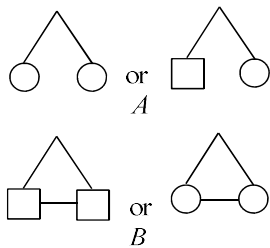
421. The tendency of offsprings to differ from their parents is called

- a) Variation b) Heredity c) Inheritance d) Resemblance

422. The gene, which controls many characters, is called

- a) Codominant gene b) Polygene c) Pleiotropic gene d) Multiple gene

423. The given diagram A and B indicates



- a) A-Zygotic twins; B-Dizygotic twins b) A-Dizygotic twins; B-Identical twins
c) A-Zygotic twins; B-Identical twins d) A-Identical twins; B-Dizygotic twins

424. Which of the following statement is/are correct regarding law of segregation?

- a) Alleles separate with each other during gametogenesis
b) The segregation of factors is due to the segregation of chromosomes during meiosis
c) Law of segregation is called as law of purity of gametes
d) All of the above

425. Which of the following discoveries resulted in a Nobel Prize?

- a) Recombination of linked genes b) Genetic engineering
c) X-rays induce sex-linked recessive lethal mutations d) Cytoplasmic inheritance

426. When alleles of two contrasting characters are present together, one of the character expresses itself during the cross while the other remains hidden. This is the

- a) Law of purity of gametes b) Law of segregation
c) Law of dominance d) Law of independent assortment

427. In which phase of meiosis-I the two chromosome can align at the metaphase plate independently of each other

- a) Metaphase-II b) Metaphase-I c) Anaphase-I d) Telophase-I

428. When a mutation is limited to the substitution of one nucleotide for another, it is called

- a) Translocation b) Point mutation
c) Base inversion d) Sugar phosphate deletion

429. Types of genotype observed in a dihybrid cross are

- a) 9 b) 12 c) 4 d) 6

430. In Morgan's experiments on linkage, the percentage of white eyed, miniature-winged recombinants in F_2 -generation is

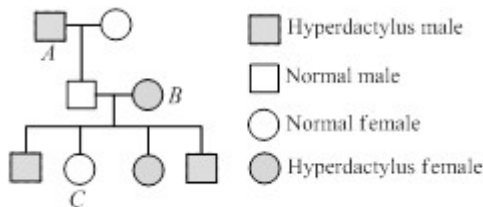
- a) 1.3 b) 37.2 c) 62.8 d) 73.2

431. Which cross was used to study the independent assortment?

- a) Monohybrid cross b) Dihybrid cross c) Trihybrid cross d) Tetrahybrid cross

432. Hyperdactyly (the possession of more than 12 finger) is determined by the dominant allele (H) and normal condition by recessive allele (h).

The diagram shows a family tree in which some members of the family are hyperdactylus



Find out the genotype of A , B and C

- a) $A-Hh$, $B-Hh$, $C-hh$ b) $A-HH$, $B-Hh$, $C-hh$ c) $A-Hh$, $B-HH$, $C-hh$ d) $A-Hh$, $B-HH$, $C-hh$

433. Which of the following statements about mutation are true?

- I. Mutations are the source of new alleles for genes
- II. Organisms are able to create mutations to meet their specific needs
- III. Mutations are random events and can happen in any cell at any time
- IV. Most mutations tend to be harmful or have no effect on an organism

- a) I, II and III b) I, II, III and IV c) I, III and IV d) I and III

434. Centromere is also called

- a) Chromomere
- b) Secondary constriction
- c) Primary constriction
- d) chromocentre

435. Which of the following statements are false?

- I. Specific mutations are acquired because they are needed
- II. Recessive alleles follow different laws of inheritance than dominant alleles do
- III. Offspring get two copies of each gene from each parent
- IV. Gametes fuse without regard to which alleles they carry

- a) II and III b) II and IV c) II, III and IV d) I, II and IV

436. Which contributed to Mendel's success?

- I. Selection of pea plant
- II. Knowledge of history
- III. One character at one time
- IV. His statistical knowledge

Choose the correct option

- a) I, II, III and IV b) II and III c) I, III and IV d) IV, III and II

437. In XX and XO chromosomal sex determination there is absence of one chromosome in

- a) Male b) Female c) Both (a) and (b) d) None of these

438. Which of the following is true about linkage

- I. It is a phenomenon in which more recombinants are produced in F_2 -generation
- II. More parental combination are produced in F_2 -generation
- III. Genotype which are present in F_1 hybrid. Reappear in high frequency in F_2 -generation
- IV. It is a phenomenon in which two chromosomes are linked

- a) Only I b) Only II c) I and III d) III and IV

439. The total number of progeny obtained through dihybrid cross of Mendel is 1280 in F_2 -generation. How many are recombinants?

- a) 240 b) 360 c) 480 d) 720

440. A child of blood group-O cannot have parents of blood groups

- a) A and A b) AB and O c) A and B d) B and B

441. Rh factor is present in

- a) All vertebrates
- b) All mammals
- c) All reptiles
- d) Man and rhesus monkey only

442. Which of the following condition is called monosomic?

- a) $2n+1$ b) $2n+2$ c) $n+1$ d) $2n-1$

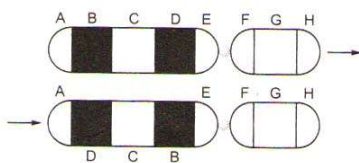
443. A man of blood group-A marries woman of blood group-AB, which type of progeny would indicate that man is heterozygous?

- a) O b) B c) A d) AB

444. The children of a haemophilic man and a normal woman are
 a) All haemophilic
 b) Only daughters are haemophilic
 c) Only sons are haemophilic
 d) Neither sons nor daughters are haemophilic
445. In man, four phenotypes of blood groups are due to the presence of antigen-A and antigen-B on the RBC. The chromosome that has the gene to control these antigens is
 a) X-chromosome b) 21st chromosome c) 9th chromosome d) 7th chromosome

446. More men suffer from colourblindness than women because
 a) Women are more resistant to disease than men
 b) The male sex hormone testosterone causes the disease
 c) The colourblind gene is carried on the 'Y' chromosome
 d) Men are hemizygous and one defective gene is enough to make them colourblind
447. 'Cri-du-chat' syndrome in humans is caused by the
 a) Fertilization of an XX egg by a normal Y-bearing sperm
 b) Loss of half of the short arm of chromosome 5
 c) Loss of half of the long arm of chromosome 5
 d) Trisomy of 21st chromosome

448. Given below is representation of a kind of chromosomal mutation. What is the kind of mutation represented?



- a) Deletion b) Duplication
 c) Inversion d) Reciprocal translocation
449. Which of the following symbols and its representation, used in human pedigree analysis is correct?
 a) = Mating between relatives b) = Unaffected male
 c) = Unaffected female d) = Affected male

450. Ischiara chart is used to detect
 a) Tuberculosis b) Eye sight c) Colour blindness d) Diabetes

451. Genes exhibiting multiple effects are known as
 a) Complementary genes b) Pleiotropic genes
 c) Cistrons d) Pseudogenes

452. A person with blood group -AB has
 a) AB antigen b) a and b antibodies c) no antigen d) antibody-a

453. Excessive growth of hair on the pinna is a feature found only in males because
 a) The female sex hormone oestrogen suppresses the character in females b) The gene responsible for the character is present on the Y-chromosomes only
 c) The gene responsible for the character is recessive in females and dominant only in males d) The character is induced in males as males produce testosterone

454. 3:1 ratio in F₂-generation is explained by
 a) Law of partial dominant b) Law of dominant
 c) Law of incomplete dominant d) Law of purity of gametes

455. Incomplete dominance is different from complete dominance in having
 a) Phenotypic ratio b) Genotypic ratio c) Both (a) or (b) d) None of these

456. A true breeding plant producing red flowers is crossed with a pure plant producing white flowers. Allele

for red colour of flower is dominant. After selfing the plants of first filial generation, the proportion of plants producing white flowers in the progeny would be

- a) 9 : 3 : 3 : 1 b) 12 : 3 : 1 c) 9 : 3 : 4 d) 9 : 6 : 1

457. Studies of human sex-linked trait shows that

- a) Male are affected mostly b) Female are carrier mostly
c) Both (a) and (b) d) Neither (a) or (b)

458. If a cross between two individuals produces offspring with 50% dominant character (A) and 50% recessive character (a), then the genotypes of parents are

- a) $Aa \times Aa$ b) $Aa \times aa$ c) $AA \times aa$ d) $AA \times Aa$

459. Mendel choose the garden pea plant for his experiment and his findings were based on

- a) Artificial pollination b) Cross-pollination
c) Self and artificial pollination d) None of the above

460. Lack of independent assortment of two genes 'A' and 'B' in fruit fly-*Drosophila* is a due to

- a) Repulsion b) Recombination c) Linkage d) Crossing over

461. One of the following is not the type of blood groups or blood factors.

- a) Lewis and Duffy b) Buffs and Kips c) ABO and Rh d) Rh and MN

462. Is it possible that same genotype have different phenotype?

- a) No – because identical genotype give identical phenotype
b) No – because of mutation
c) Yes– because different environment can produce different phenotype of the same genotype
d) Yes – because phenotype decides the genotype

463. ABO blood groups in human are controlled by the gene I. It has three alleles – I^A , I^B and i. since there are three different alleles, six different genotypes are possible. How many phenotypes can occur?

- a) Three b) One c) Four d) Two

464. Probability of genotype TTrr in F_2 -generation of a dihybrid cross is

- a) $\frac{1}{16}$ b) $\frac{3}{16}$ c) $\frac{9}{16}$ d) $\frac{6}{16}$

465. In a cross between individuals with genotypes Tt Rr, if the resulting number of offsprings is 16, then identify the number of genotypes with TtRr and TtRR amongst them.

- a) 1 and 2 b) 2 and 3 c) 3 and 1 d) 4 and 2

466. Which of the following genotypes does not produce any sugar polymer on the surface of the RBC?

- a) $I^A I^A$ b) $I^B i$ c) $I^A I^B$ d) i i

467. The diagrammatic representation of the chromosomes of an individual is called

- a) Idiogram b) Karyotype c) Phenotype d) diploidy

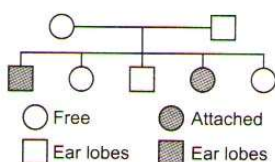
468. In *Mirabilis*, a hybrid for red (RR) and white (rr) flower produces pink (Rr) flower. A plant with pink flower is crossed with white flower, the expected phenotypic ratio is

- a) Red : pink : white(1 : 2 : 1) b) Pink : white(1 : 1)
c) Red : pink (1 : 1) d) Red : white (3 : 1)

469. A marriage between normal visioned man and colourblind woman will produce, which of the following types of offsprings?

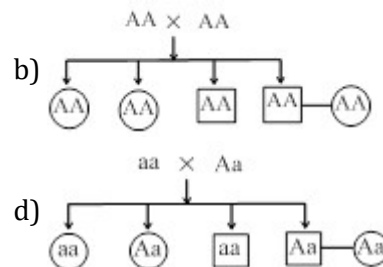
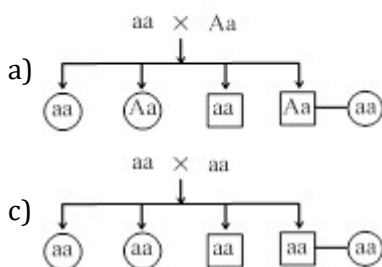
- a) Normal sons and carrier daughters b) Colourblind sons and carrier daughters
c) Colourblind sons and 50%carrier daughters d) 50% colourblind sons and 50%carrier daughters

470. Given below is a pedigree chart of a family with five children. It shows the inheritance of attached ear lobes as opposed to the free ones. The squares represent the male individuals and circles the female individuals. Which of the following conclusions drawn is correct?



- a) The parents are homozygous recessive b) The trait is Y-linked

- c) The parents are homozygous dominant d) The parents are heterozygous
471. I. Myotonic dystrophy is an autosomal dominant trait
 II. Sickle-cell anaemia is an autosomal recessive trait
 III. Failure of segregation of alleles results in chromosomal loss
 IV. Failure of segregation of allele result in chromosomal gain
 V. Cystic fibrosis is a Mendelian disorder
 Correct statements are
 a) I, II, III and IV b) I, III, IV and V c) I, II, IV and V d) All of these
472. Haemophilia is more commonly seen in human males than in human females because
 a) This disease is due to a X-linked dominant mutation b) A greater proportion of girls die in infancy
 c) This disease is due to a X-linked recessive mutation d) This disease is due to a Y-linked recessive mutation
473. Which one of the following was the rediscoverer of Mendel's work?
 a) Muller b) Morgan c) Correns d) Bridge
474. $\frac{1}{4} : \frac{1}{2} : \frac{1}{4}$ ratio of TT : Tt : tt can be depicted mathematically binomial expression as (ideally)
 a) $(ax + by)^2$ b) $(ax + by)^3$ c) $(Ax + By)^4$ d) $ax + by$
475. Pure red flowers was crossed with pure white flowers. Red is dominant. After selfing of F₁-generation, the proportions of plants producing white flowers in progeny would be
 a) $\frac{3}{4}$ b) $\frac{1}{4}$ c) $\frac{1}{3}$ d) $\frac{1}{2}$
476. Which of the following abnormalities, results from an unnatural presence of a Barr body?
 a) Turner's syndrome b) Down's syndrome
 c) Klinefelter's syndrome d) All of these
477. When normal and mutant alleles are present on opposite chromosomes of homologous pair, the heterozygotes are called as
 a) *cisheterozygotes* b) Homologous heterozygotes
 c) *transheterozygotes* d) None of the above
478. When two unrelated individuals or lines are crossed, the performance of F₁ hybrid is often superior to both its parents. This phenomenon, is called
 a) Transformation b) Splicing c) Metamorphosis d) heterosis
479. The types of gametes produced by a heterozygous allelic pair is/are
 a) 1 b) 2 c) 3 d) Many
480. Prokaryotic genetic system has
 a) DNA and histone b) DNA and no histone
 c) No DNA and histone d) No DNA and no histone
481. A chromosome in which the centromere is situated close to its end so that one arm is very short and the other very long is
 a) Acrocentric b) Metacentric c) Sub- metacentric d) telocentric
482. Write the genotype of the previous questions



483. Sickle cell anaemia is
 a) An autosomal linked dominant trait
 b) Caused by substitution of valine by glutamic acid in the β -globin chain of haemoglobin
 c) Caused by a change in base pair of DNA
 d) Characterized by elongated sickle like RBCs with a

nucleus

484. Improvement of human race through hereditary qualities is called
 a) Disruptive b) Directional c) Stabilizing d) Coevolution
485. ...A... gene produces all gametes that are similar, while a ...B... produces two kinds of gametes each having one allele with equal proportion
 Choose the correct option for A and B
 a) A-homozygous; B-heterozygous b) A-homozygous; B-dominance
 c) A-homozygous; B-recessive d) A-heterozygous; B-homozygous
486. In which one of the following combinations (a-d) of the number of the chromosomes is the present day hexaploid wheat correctly represented?

Combination	Mono somic	Haploid	Nullisomic	Trisomic
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- a) 27-28-42-43 b) 7-82-40-42 c) 21-7-42-43 d) 41-21-40-43

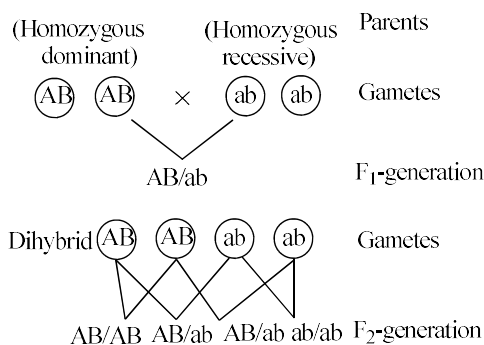
487. When the number of recombinant progeny is usually less than the number expected in independent assortment it is called
 a) Complete linkage
 b) Incomplete linkage
 c) Complete recombination
 d) Complete independent assortment
488. The enzyme missing in phenylketonuria is
 a) Phenylalanine hydroxylase b) Phenylalanine reductase
 c) Phenylalanine oxidase d) Phenylalanine oxidoreductase

489. Gene is
 a) One pair of allele
 b) Alternative form of a gene
 c) Present in allelic form on homologous
 d) Both (a) and (c) are correct

490. The telomeres of eukaryotic chromosomes consist of short sequences of
 a) Thymine rich repeats b) Cytosine rich repeats
 c) Adenine rich repeats d) Guanine rich repeats

491. In Mendelian dihybrid cross when heterozygous Round Yellow are self crossed. Round Green offsprings are represented by the genotype
 a) RrYy, RrYY and RRYy b) Ryy, RYy, and ryy c) rrYy and rrYY d) Ryy and RYy

492. Study the given test cross and choose the correct option for F₂-generation



- a) Hybrid cross (9 : 3 : 3 : 1) b) Hybrid cross (3 : 1)
 c) Dihybrid cross (12 : 4) d) Dihybrid linked gene cross (3 : 1)
493. Mendel's principle of segregation means that the germ cells always receive
 a) One pair of alleles b) One quarter of the genes
 c) One of the paired alleles d) Any pair of alleles
494. Law based on fact that the characters don't show any blending and both the characters are recovered as

such in F_2 -generation although one character was absent in F_1 -progeny, is

- a) Law of purity of gametes
- b) Law of independent assortment
- c) Law of incomplete dominance
- d) Law of dominance

495. In *Melandrium*, the sex determination type is

- a) XX-XY
- b) XX-XO
- c) ZZ-ZW
- d) XY-XO

496. The effect of today's radioactive fallout will probably be more harmful to children of future generation than to children now living because

- a) Infants are more susceptible to radiations
- b) Susceptibility to radiation increases with age
- c) Mutated genes are frequently recessive
- d) Contamination of milk supply is not cumulative

497. Select the statement which is not correct.

- a) Polygenic character is controlled by multiple alleles
- b) In case of polygenic inheritance, thousands of intermediate phenotypes are found between two extreme ones
- c) Height, weight, skin colour are polygenic
- d) ABO blood group system is an example of multiple allelism

498. Linkage was first suggested by

- a) Sutton and Boveri
- b) Morgan
- c) De Vries
- d) Pasteur

499. X-linked recessive gene is

- a) Always expressed in male
- b) Always expressed in female
- c) Lethal
- d) Sub-lethal

500. Gene for colour blindness is located on

- a) Y-chromosome
- b) 13th chromosome
- c) X-chromosome
- d) 21st chromosome

501. A. $\frac{X}{A} = 1$

B. $\frac{X}{A} > \text{more than } 1$

C. $\frac{X}{A} = 0.5$

Here, X = number of X-chromosome

A = set of autosomal pair

Choose the correct option for A, B and C result

- a) A-female B-meta female C-male
- b) A-female B-meta female C-female
- c) A-female B-female C-male
- d) A-meta female B-female C-male

502. The ABO blood group are controlled by

- a) I-gene
- b) c-gene
- c) B-gene
- d) n-gene

503. Which of the following is considered as a recessive character of Mendel?

- a) Round seed
- b) Wrinkled seed
- c) Axial flower
- d) Green pod

504. When an animal has both the characters of male and female, it is called

- a) Intersex
- b) Superfemale
- c) Supermale
- d) gynadromorph

505. Point mutation arises due to change in

- a) Single base DNA
- b) Single base pair of DNA
- c) Segment of DNA
- d) Double base pair of DNA

506. colour blindness is more observed in humans

- a) Male
- b) Female
- c) Infant
- d) In old age

507. Mendel cross tall and dwarf plant. In F_2 -generation the observed ratio was 3:1 (tall: short). From this result, he deduced

- I. law of dominance
- II. law of independent assortment
- III. law of segregation

IV. incomplete dominance

Choose the correct option

- a) I, II, III and IV b) I and III c) II, III and IV d) I, II and III
508. Genetic or chromosomal symbol used for the person who is having sickle-cell anaemia is
a) $Hb^s Hb^s$ b) $Hb^a Hb^a$ c) $Hb^g Hb^g$ d) $Hb^m Hb^m$
509. Which of the following is true regarding human genetics?
a) Most characters are controlled by one gene
b) Same characters are controlled by more than two genes
c) Same characters are not inherited according to Mendel's law
d) All of the above
510. Foetal sex is determined by examining cells from amniotic fluid looking for
a) Chiasmata b) Barr bodies c) Sex chromosomes d) None of these
511. Sex-linked allele or disease never passes from
a) Women to her daughter
b) Man to daughter
c) Women to grand daughter
d) Man to his son
512. What is genotypic ratio in a dihybrid cross?
a) $1 : 2 : 1 : 2 : 4 : 2 : 1 : 2 : 1$ b) $2 : 4 : 2 : 1 : 2 : 1 : 1 : 2 : 1$
c) $1 : 4 : 2 : 1 : 1 : 1 : 2 : 1$ d) $4 : 2 : 1 : 1 : 1 : 1 : 2 : 1 : 1$
513. The law of segregation of characters is also called the law of purity of gametes because
a) Gametes have only one of the two alleles for each characters
b) Gametes cannot be contaminated
c) Gametes are very different types of cells d) It was just another name adopted accidentally
514. Four children belonging to the same parents have the following blood groups A, A, AB and O. Hence, the genotypes of the parents are
a) Both parents are homozygous for 'A' group
b) One parent is homozygous for 'A' and another parent is homozygous for 'B'
c) One parent is heterozygous for 'A' and another parent is heterozygous for 'B'
d) Both parents are homozygous for 'B' group
515. Mendel work later formulated into laws of
I. Linkage
II. Segregation
III. Incomplete dominance
IV. Independent assortment
Choose the correct option
a) I, III and IV b) II and IV c) II, III and IV d) I, II and III
516. Barr body is associated with
a) Sex chromosome of female b) Sex chromosome of male
c) Autosome of female d) Autosome of male
517. A man can inherit his X-chromosome from his
a) Maternal grandmother or maternal grandfather b) Father
c) Maternal grandfather d) Paternal grandfather
518. The types of gametes formed by the genotype $Rr Yy$ are
a) RY, Ry, rY, ry b) RY, Ry, ry, ry c) Ry, Ry, Yy, ry d) Rr, RR, Yy, YY
519. Mating of an organism to a double recessive in order to determine whether it is homozygous or heterozygous for a character under consideration, is called
a) Reciprocal cross b) Test cross c) Dihybrid cross d) Back cross
520. Polyploidy means occurrence of
a) Haploid sets of chromosomes b) Diploid sets of chromosomes
c) More than diploid sets of chromosomes d) All of the above

521. Both husband and wife have normal vision though their fathers were colourblind and mothers did not have any gene for colour blindness. The probability of their daughter becoming colourblind is
a) 50% b) 75% c) 25% d) None of these
522. L-shaped chromosomes are also called
a) Acrocentric b) Telocentric c) Sub-metacentric d) None of these
523. A homozygous sweet pea plant with blue flowers (RR) and long pollen (R_0R_0) is crossed with a homozygous plant having red flowers (rr) and round pollen (r_0r_0). The resultant F_1 hybrid is test crossed. Which of the following genotype does not appear in its progeny?
a) $Rrrr_0$ b) $RrRr_0$ c) Rrr_0r_0 d) rrR_0r_0
524. A diseased man marries a normal woman and they get three daughters and five sons. All the daughters were diseased and sons were normal. The gene of this disease is
a) Sex-linked dominant b) Sex-linked recessive
c) Sex-limited character d) Autosomal dominant
525. A polygenic trait is controlled by 3 genes A, B and C. In a cross $AaBbCc \times AaBbCc$, the phenotypic ratio of the offsprings was observed as $1 : 6 : x : 20 : x : 6 : 1$. What is the possible value of x ?
a) 3 b) 9 c) 15 d) 25
526. Chromosomal mutations occurs due to
I. Deletion II. Duplication
III. Translocation IV. Inversion
Choose the correct option
a) I, II and III b) II, III and IV c) I, III and IV d) All of these
527. The allele which expresses itself in both homozygous and heterozygous condition is called
a) Dominant allele b) Recessive allele
c) Incomplete dominant allele d) Split allele
528. Equatorial division and reductional division takes place in which types of cell division
a) Meiosis, mitosis b) Mitosis, meiosis c) Both (a) and (b) d) Amitosis, meiosis
529. Monohybrid test cross ratio is
a) 3 : 1 b) 2 : 1 c) 1 : 1 d) 9 : 3 : 3 : 1
530. Who gave the term 'genetics'?
a) Mendel b) Robert Hooke c) Bateson d) Purkinje
531. In which of the following disorders, blood has a defective haemoglobin?
a) Haemophilia b) Haematuria c) Haematoma d) Sickle cell anaemia
532. In sickle cell anaemia, the glutamic acid is replaced by
a) Proline b) Alanine c) Serine d) Valine
533. Which of the following cannot be explained on the basis of Mendel's Law of Dominance?
a) The discrete unit controlling a particular character is called a factor
b) Out of one pair of factors one is dominant, and the other is recessive
c) Alleles do not show any blending and both the characters recover as such in F_2 generation
d) Factors occur in pairs
534. Find out the percentage of dominant phenotype in cross between Pp and Pp. P-dominant, p-recessive
a) 25% b) 50% c) 75% d) 100%
535. Gametes produced by a homozygous individual is/are of types
a) 1 b) 2 c) 3 d) Many
536. What will be the gametic chromosomes number of a cell, if somatic cell have 40 chromosomes?
a) 10 b) 20 c) 30 d) 40
537. Human female possesses 44+XX chromosomes. The secondary oocyte shall have
a) 44 + XX b) 22 + X c) 22 d) 44
538. Select the correct statement from the ones given below with respect to dihybrid cross.
a) Antirrhinum b) Pisum c) Solanum d) Hibiscus
539. Test cross is when

- a) F_1 crossed with heterozygous parent b) F_1 crossed with homozygous dominant parent
c) F_1 crossed with homozygous recessive parent d) F_1 crossed with homozygous parent
540. Sex chromosomes are also known as
a) Autosomes b) Allosomes c) Genome d) karyotype
541. Euploidy is best explained by
a) Exact multiple of a haploid set of chromosomes
b) One chromosome less than the haploid set of chromosomes
c) One chromosome more than the haploid set of chromosome
d) One chromosome more than the diploid set of chromosomes
542. In which year Mendel's work rediscovered
a) 1900 b) 1901 c) 1902 d) 1903
543. Which of the following diseases is governed by pleiotropic genes?
a) Sickle cell anaemia b) Haemophilia c) Colour blindness d) None of these
544. Inheritance of skin colour in human is an example of
a) Chromosomal aberration b) Codominance
c) Point mutation d) Polygenic inheritance
545. Heterochromatin remains condensed in which part of chromosome?
a) Secondary constriction-I b) Secondary constriction-II
c) Telomeres d) Both (a) and (b)
546. A plant of F_1 - generation has genotype 'AABbCC'. On selfing of this plant, the phenotypic ratio in F_2 - generation will be
a) Polyploidy b) Incomplete dominance
c) Multiple allelism d) polygeny
547. Which have great importance in genetics?
a) *Penicillium* b) *Claviceps* c) *Neurospora* d) None of these
548. Number of Barr bodies in XXXXY is
a) 1 b) 2 c) 3 d) 4
549. Dihybrid ratio of the linked gene is
a) 1 : 1 b) 1 : 1 : 1 : 1 c) 9 : 3 : 3 : 1 d) 3 : 1
550. Polyploidy can be induced by the application of
a) Auxin b) Kinetin c) Colchicine d) ethylene
551. If a plant having yellow or round seeds was crossed with another plant having green and wrinkled seeds then F_1 -progeny are in the ratio
a) 15 : 1 b) 1 : 15
c) 1 : 13 d) All yellow and round seeds
552. Which of the following, can be used to describe the alleles correctly?
a) Alternative form of a gene b) Dominant form of gene
c) Recessive form of a gene d) One gene pair
553. Which of the following animals is mostly used in genetics experiments?
a) Butterfly b) Fruit fly c) Housefly d) Dragon fly
554. Which of the following diseases results from the genetic inability to synthesize a single enzyme?
a) Colour blindness b) Down's syndrome c) Phenylketonuria d) Diabetes
555. Balbiani rings are the structural features of
a) Allosomes
b) Polytene chromosomes
c) Autosomes
d) Lampbrush chromosomes
556. Sometimes, there are more than two alleles for a given chromosome locus. In this case, a trait is controlled by
a) Codominance b) Pseudodominance
c) Incomplete dominance d) Multiple alleles

557. Two pea plants were subjected for cross pollination. Of the 183 plants produced in the next generation, 94 plants were found to be tall and 89 plants were found to be dwarf. The genotypes of the two parental plants are likely to be

- a) TT and tt b) Tt and Tt c) Tt and tt d) TT and TT

558. In haplodiploidy determination of sex, males is

- a) Haploid b) Diploid c) Haplodiploid d) Diplohaploid

559. A cross between F_1 -hybrid and a heterozygous parent ($Tt \times tT$) gives the phenotypic ratio of

- a) 1 : 1 b) 3 : 1 c) 2 : 1 d) 4 : 1

560. When mutation is confined to only one substitution, it is called

- a) Translocation b) Point mutation c) Base inversion d) Frame shift

561. Letter symbol refers to the dominant factors give a ...A... or upper case letter of the alphabet. A corresponding ...B... or lower case letter is used for recessive factor. Here A and B refers to

- a) A-capital; B-small b) A-small; B-capital
c) A-capital; B-capital d) A-small; B-small

562. In a gene pool, along with beneficial mutations those mutations also exists which are damaging to an individual. It has been found that these mutations are irreversible because

- I. they have survival value
II. they are acquired
III. they are recessive and carried by heterozygous individuals only
IV. they show genetic drift

Choose the incorrect option for given statement

- a) I and III b) I and II c) II and IV d) Only III

563. In a medicolegal case of accidental interchange between two babies in a hospital, the baby of the blood group-A could not be rightly given to a couple with

- a) Husband of O group and wife of AB group b) Husband of A group and wife of O group
c) Husband of B group and wife of O group d) Husband of AB group and wife of A group

564. The plasma membrane of the red blood cells has ...A... polymers that protrude from its surface and the kind of sugar is controlled by the gene. The gene I has three alleles ...B... The alleles I^A and I^B produce a slightly different form of the sugars, while allele i doesn't produce any ...C...

Choose the correct option for A,B and C

- a) A-protein, B – $I^A I^B I^O$, C-protein b) A-protein, B – $I^A I^B I^O$, C-sugar
c) A-sugar, B – $I^A I^B I^O$, C-protein d) A-sugar, B – $I^A I^B I$, C-sugar

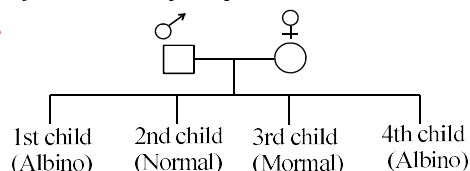
565. The person famous for experimental genetics

- a) TH Morgan b) Sutton c) Boveri d) Robert Hooke

566. Morgan worked with tiny fruit fly names as

- a) *Drosophila melanogaster* b) *Mangifera indica*
c) *Mirabilis jalapa* d) *Drosophila indica*

567.



A=Normal allele, a = Albino allele.

Find out genotype of $\square \sigma^{\circ}$ and $\bigcirc \text{♀}$ (father and mother)

Father σ°	Mother ♀
a) A a	A A
c) A A	A A

b) A A	A a
d) A a	A a

568. Linkage group is

- a) Linearly arranged group of linked gene b) Non-linearly arranged group of linked gene

- c) Non-linearly arranged group of unlinked gene d) Non-linearly arranged group of single gene
569. Some individuals with blood group –A may inherit the genes for blonde hair, while other individuals with blood group – A may the gene for brown hair. This can be best explained by the principle of
 a) 3 : 1 b) 9 : 3 : 3 : 1 c) 1 : 1 d) 1 : 1 : 1 : 1
570. I. 100% parental combinations are found in F₂-generation
 II. F₂ phenotypic ratio is 3 : 1 in dihybrid cross
 III. Dihybrid test cross ratio is 1 : 1 in F₂-generation
 IV. Linked genes tends to separate frequently
 Choose the correct options from the above given statements
 a) I, II and IV b) I, III and IV c) II, III and IV d) I, II and III
571. The following diagram shows two chromosomes and the lettered number represents the genes
- | Chromosome 1 | Chromosome 2 |
|-----------------|--------------|
| P Q R S T U V W | E F G H |
- Which of the following would result if a translocation occurred between chromosome 1 and 2?
- a) P Q R S W V U T E F G H b) P Q R S T U V W E F G H
 c) P Q R S T U V W E F H d) P Q R S T U V W E F G H G H
572. Experimental verification of the chromosomal theory of inheritance was given by
 a) Gregor Johann Mendel b) Hugo de Vries
 c) Langdon Down d) Thomas Hunt Morgan
573. A gene that masks another gene's expression, is called
 a) Dominant b) Recessive c) Epistatic d) Assorted
574. Transposons are
 a) House- keeping genes b) Jumping genes
 c) Transporting genes d) Stationary genes
575. Which of the following law was discovered first by Mendel?
 a) Law of dominance b) Law of segregation
 c) Law of independent assortment d) Law of sex determination
576. Unit of inheritance that required to express a particular trait of organism is called
 a) Factors b) Genes c) Phenotype d) Genotype
577. Sex limited traits are the
 a) Traits appeared in particular sex
 b) Traits which governed by genes present in both sexes
 c) Traits which influenced by the sex hormones
 d) All of the above
578. Variation stands for differences in traits of progenies from
 a) Each other b) Parents
 c) Both (a) and (b) d) From mother only
579. In which mode of inheritance, do you expect more maternal influence among the offsprings?
 a) Autosomal b) Cytoplasmic c) Y-linked d) X-linked
580. Mutagens are
 a) Chemical agents which cause change in DNA
 b) Physical agents which cause mutation
 c) Cancer producing agents
 d) Both (a) and (b)
581. Which is incorrect for Mendelism?
 a) Works on garden pea b) Law of segregation proved by monohybrid cross
 c) Discovered linkage d) All of the above
582. In heterozygous condition, the individual expression of both the alleles in the phenotype is exemplified by
 a) Colourblindness b) AB blood group c) Rh factor d) A and B blood group
583. Polyploid derived from two different species is called

- a) Autopolyploid b) Triploid c) Allopolyploid d) monoploid

584. Walter Sutton is famous for his contribution to

- a) Genetic engineering b) Totipotency
c) Quantitative genetics d) Chromosomal theory of inheritance

585. Humans knew from as early as ...A... BC that one of the causes of variation was hidden in ...B...

reproduction. They exploited ...C... that were naturally present in wild population, A, B and C here refer to

- a) A-8000-1000 BC, B-sexual, C-variations
b) A-8000-15000 BC, B-sexual, C-similarity
c) A-8000-15000 BC, B-sexual, C-similarity
d) A-20000-25000 BC, B-sexual, C-similarity

586. Punnett square was developed by

- a) RC Punnett b) RB Punnett c) RD Punnett d) RE Punnett

587. Female is heteromorphic and male is homomorphic in

- a) Fishes and bird b) Reptiles
c) Butterflies and moth d) All of these

588. Absence of one sex chromosome causes

- a) Turner's syndrome b) Klinefelter's syndrome
c) Down's syndrome d) Tay-Sach's syndrome

589. Mendelian recombinations are due to

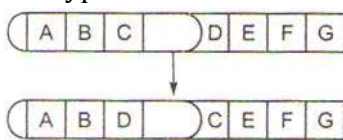
- a) Linkage b) Mutations
c) Dominant characters d) Independent assortment

590. The important things to remember are that chromosomes as well as genes occur in ...A... .The two alleles of a gene pair are located on homologous sites on ...B... chromosomes

Choose the correct choice for A and B

- a) A-single, B-analogous b) A-pair, B-analogous
c) A-pair, B-homozygous d) A-single, B-heterozygous

591. The type of chromosomal aberration indicated in the diagram shows



- a) Interstitial translocation b) Reciprocal translocation
c) Pericentric inversion d) Paracentric inversion

592. Who proposed chromosomal theory of linkage?

- a) Morgan b) Castle c) Both (a) and (b) d) Bateson

593. Which factor expresses itself in homozygous and even in heterozygous condition?

- a) Dominant factor b) Weak factor c) Recessive factor d) Incomplete factor

594. Number of autosomes in human are

- a) 23 pairs b) 22 pairs
c) 46 chromosomes d) 33 pairs of chromosomes

595. A tall plant was grown in nutrient deficient soil and remained dwarf. When it is crossed with dwarf plant then

- a) All hybrid plants are dwarf b) All hybrid plants are tall
c) 50% tall and 50% dwarf d) 75% tall and 25% dwarf

596. A man of blood group-A, marries a woman of blood group-B, both of them are heterozygous for blood group, chances of their first child having blood group AB will be

- a) 25% b) 50% c) 75% d) 100%

597. Mendel's laws of inheritance are applicable only for

- a) Protista b) Monera c) Diploid organism d) Both (a) and (b)

598. The factors which expresses only in homozygous condition is

- a) Dominant b) Recessive c) Hidden d) Cryptic

599. Human skin colour is the example of
- multiple gene inheritance
 - three separate genes controlling this trait
 - single gene controlling this trait
 - two gene controlling this trait
 - environment plays a significant role in this trait

Choose the correct option

- a) I,II and III b) II,III and IV c) III,IV and V d) I,II and V

600. In haemophilia, a single protein that is a part of cascade of protein involved in ...A... of ...B... is affected.

Single cut will result in ...C... bleeding.

Choose the correct option for A, B and C

- a) A-coagulation, B-RBC, C-continuous b) A-coagulation, B-WBC, C-continuous
c) A-clotting, B-blood, C-continuous d) A-coagulation, B-blood, C-continuous

601. In *Drosophila*, the allele for a normal grey body colour G is dominant to ebony body g. The following table summarises the results of several crosses

S.No	Cross	Result
I.	Strain 1 × gg	All wild type
II.	Strain 2 × gg	1 wild type : 1 ebony
III.	Strain 3 × gg	All ebony
IV.	Strain 4 × gg	3 wild type : 1 ebony

Which strains both have the genotype Gg?

- a) I and III b) I and IV c) II and III d) II and IV

602. An Rh⁻ individual receives Rh⁺ blood. The recipient becomes

- a) Sterile b) Dead c) No reaction d) isoimmunized

603. In a mutational event, when adenine is replaced by guanine, it is the case of

- a) Frameshift mutation b) Transcription
c) transition d) transversion

604. Recessive characters are expressed

- a) On any autosome b) On both the chromosomes of female
c) When they are present on X-chromosomes of male d) When they are present on X-chromosomes of female

605. The crossing of F₁ to any one of the parents is called

- a) Back cross b) Test cross c) F₁ cross d) All of these

606. In cross between yellow round (YYRR) and green wrinkled (yyrr) find out the ratio between seeds having yellow and green seed colour

- a) 3 : 2 b) 3 : 1 c) 9 : 7 d) 7 : 9

607. Genes for colour blindness is carried by

- I. Abnormal development II. Father
III. Mother IV. Autosomes

- a) I and II b) II and III c) III and I d) I and IV

608. Monosomy and trisomy are respectively

- a) $n - 1, n + 2$ b) $2n + 2, 2n + 1$ c) $2n - 1, 2n + 1$ d) $n - 2, 2n + 1$

609. I. Haemophilia

- II. Cystic fibrosis
III. Sickle-cell anaemia
IV. Colour blindness
V. Cancer

VI. Plague

VII. Phenylketonuria

VIII. Thalassaemia

Choose the correct options for Mendelian disorders

a) I, II, III, IV, VI, VIII b) I, II, III, IV, VII, VIII c) I, II, III, IV, V, VI d) I, II, III, IV, V, VIII

610. in α -thalassaemia, the affected chromosomes is

a) 16th b) 17th c) 18th d) 19th

611. The first hybrid progenies obtained by Mendel were called

a) F_1 - progeny b) F_0 - progeny c) F_2 - progeny d) F_3 - progeny

612. What type of gametes will form by genotype $RrYy$?

a) RY, Ry, rY, ry b) RY, Ry, ry, ry c) Ry, Ry, Yy, ry d) Rr, RR, Yy, YY

613. A condition, where a certain gene is present in only a single copy in a diploid cell, is called

a) Heterozygous b) Monogamous c) Homozygous d) hemizygous

614. Frequency of crossing over is ...A... in linked gene ...B... in unlinked gene.

Choose correct combination for A and B

a) A-more; B-less
b) A-less; B-more
c) A-same; B-same
d) A-same; B-happened

615. Find out the phenotypic and genotypic ratios in previous question

a) $1:2:1, 1:3$ b) $1:2:1, 3:1$ c) $1:2:1, 1:2:1$ d) $1:3:1, 1:2:1$

616. Which one of the following is necessary to start clotting of blood?

a) Heparin b) Serotonin
c) Thromboplastin and Ca^{2+} d) Fibrinogen and prothrombin

617. The organism chosen by Mendel to explain the law of inheritance is

a) *Drosophila melanogaster* b) *Antirrhinum majus*
c) *Pisum sativum* d) *Homo sapiens*

618. A woman is married for the second time. Her first husband was ABO blood type A, and her child by that marriage was type O. Her new husband is type B and their child is type AB.

What is the women's ABO genotype and blood type?

a) $I^A I^O$; Blood type A b) $I^A I^B$; Blood type AB c) $I^B I^O$; Blood type B d) $I^O I^O$; Blood type O

619. A couple has 6 children-5 are girls and 1 is boy. The percentage of having a girl on next time is

a) 10% b) 20% c) 50% d) 100%

620. On selfing $RrTt$, we produce 400 plants, find out number of plants with genotype $RrTt$.

a) 100 b) 225 c) 50 d) 300

621. In the ABO system of blood groups, if both antigens are present but no antibody, the blood group of the individual would be

a) B b) O c) AB d) A

622. Barr body in mammals represents

a) All the heterochromatin in female cells
b) One of the two X-chromosomes in somatic cells of females
c) All the heterochromatin in male and female cells
d) The Y-chromosome in somatic cells of male

623. When a segment of a chromosome breaks and later rejoins after 180° rotation, it is known as

a) Deletion b) Duplication
c) Inversion d) Interstitial translocation

624. Human skin colour is controlled by several gene pairs. Let us assume here that there are just three gene pairs on different chromosomes and that for each pair there are two alleles an incompletely dominant one that codes for no melanin deposition and an incompletely recessive one that codes for no melanin deposition. If a very dark skinned person marries a very light skinned women, what will be the chance that

their offspring will have very dark skin?

- a) 0 b) $\frac{1}{4}$ c) $\frac{5}{8}$ d) $\frac{9}{64}$

625. If a cross is made between AA and aa, the nature of F_1 -progeny will be

- a) Genotypically AA, phenotypically a b) Genotypically Aa, phenotypically a
c) Genotypically Aa, phenotypically A d) Genotypically aa, phenotypically A

626. In Barr body (sex-chromatin) of a normal female

- a) One of the X-chromosome of paternal side becomes inactive to form Barr body
b) Y-chromosomes form Barr body
c) Heterochromatin condense near centre of nucleus to form Barr body
d) One of the X-chromosome of maternal side becomes inactive and form Barr body near nuclear membrane

627. In certain plant species, red flower colour is incompletely dominant to white flower colour (the heterozygote is pink) and tall stems are completely dominant to dwarf stem. If a tall pink plant (TtRr) is crossed with a tall white plant (TTrr), which one of the following type of plants would be produced in the offsprings?

- a) Tall pink and tall white b) Dwarf pink and tall red
c) Dwarf red and tall pink d) Tall pink and dwarf white

628. Which is true about meiotic cell division?

- I. Meiosis only occurs in diploid organism without any exception
II. RNA is replicated during S-phase
III. Chromatids of a chromosome separate during anaphase-I
IV. Only sperms are produced by this process

- a) I and III b) I and II c) Only I d) III and IV

629. Work of Beadle and Tatum on *Neurospora crassa* proved that

- a) Replication of DNA is semi-conservative b) Viruses have genetic material
c) Every gene is responsible for specific enzymes d) Plant cells are totipotent

630. Which of the following pairs of chromosomal mutation are most likely to occur when homologous chromosomes are undergoing synapsis?

- a) Deletion and inversion b) Duplication and translocation
c) Deletion and duplication d) Inversion and translocation

631. Down's syndrome is an example of

- a) Aneuploidy b) Polytomy c) Polyploidy d) Monoploidy

632. Mendel's works were read out the

- a) Natural History Society in Russia b) Natural History Society in America
c) Natural History Society in Brunn d) Natural History Society in Germany

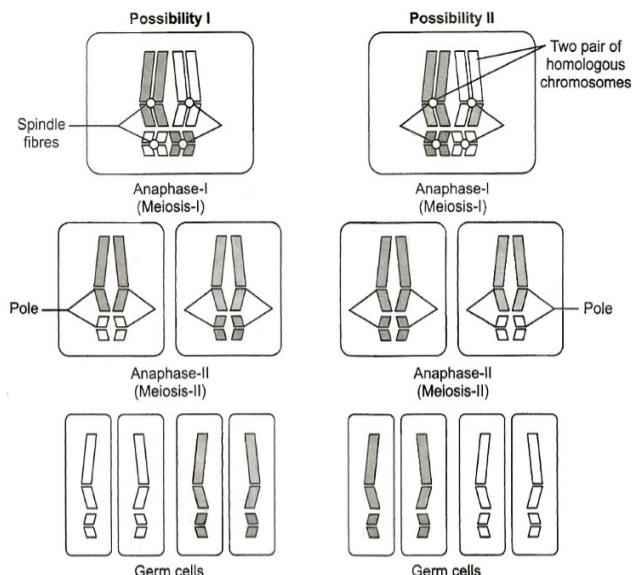
633. Genes of which of the following disorder are present exclusively on the X-chromosome in humans or concerned with

- a) Baldness b) Red-green colour blindness
c) Facial hair/moustaches in males d) Night blindness

634. In a given plant, red colour (R) of fruit is dominant over white fruit (r); and tallness (T) is dominant over dwarfness (t). If a plant with genotype RRTt is crossed with a plant of genotype rrtt, what will be the percentage of tall plants with red fruits in the next generation?

- a) 100% b) 25% c) 50% d) 75%

635. The figure depicts



- a) Linkage
 c) Law of dominance
 b) Independent assortment
 d) Equational division

636. Pick out the correct statements.

- I. Haemophilia is a sex-linked recessive disease
 II. Down's syndrome is due to aneuploidy
 III. Phenylketonuria is an autosomal dominant gene disorder
 IV. Phenylketonuria is an autosomal recessive gene disorder
 V. Sickle cell anaemia is an X-linked recessive gene disorder

- a) I, III and V are correct
 b) I and III are correct
 c) II and V are correct
 d) I, II and IV are correct

637. Allelic sequence variations, where more than one variant (allele) at a locus in a human population with a frequency greater than 0.01, is referred to as

- a) Incomplete dominance
 b) Multiple allelism
 c) SNP
 d) DNA polymorphism

638. Sex chromosomes of a female bird are represented by

- a) XO
 b) XX
 c) XY
 d) ZW

639. How many types of gametes may be produced by genotype D/d : E/e : F/f?

- a) 27
 b) 8
 c) 3
 d) 6

640. If a colourblind woman marries a normal visioned man their sons will be

- a) All normal visioned
 b) One half normal and one half colourblind
 c) Three fourth colourblind and one fourth normal
 d) All colourblind

641. Genic balance theory of sex determination, stated by C B Bridges, is related to

- a) *Drosophila melanogaster*
 b) *Rumex*
 c) Snapdragon
 d) None of the above

642. In human beings, 45 chromosomes/single X/XO abnormality causes

- a) Down's syndrome
 b) Klinefelter syndrome
 c) Turner's syndrome
 d) Edward's syndrome

643. When a cluster of genes show linkage behaviour they

- a) Do not show independent assortment
 b) Induce cell division
 c) Do not show a chromosome map
 d) Show recombination during meiosis

644. Colour blindness is a failure to discriminate between

- a) Red and blue
 b) Red and green
 c) Red and black
 d) Red and white

645. Linkage group in *E. coli* is/are

- a) 4
 b) 2
 c) 1
 d) 5

646.

Linked Gene pair	Cross Over Value (COV)
T and U	25

T and V	5
V and U	30
U and W	10
V and W	20

COV are given for linked gene pair. Find out their sequence in the chromosome

- a) VTWU b) TVWU c) BTWVU d) VWTU

647. The tendency of offsprings to resemble their parents is called

- a) Variation b) Heredity c) Inheritance d) Resemblance

648. In case of incomplete dominance, what will be the phenotypic ratio of F_2 generation?

- a) 1 : 2 : 1 b) 3 : 1 c) 1 : 1 : 1 : 1 d) 9 : 3 : 3 : 1

649. The major reason for the success of Mendelian experiments was

- a) Garden pea was true breeding b) Garden pea was cross breeding
c) Garden pea was heterozygous d) Garden pea was not easily available

650. Which of the following is best suited for codominance?

- a) Both of recessive b) Both of dominant c) One is recessive d) One is dominant

651. ABO blood group system is given by

- a) Landsteiner b) Wallace c) de Vries d) Lamarck

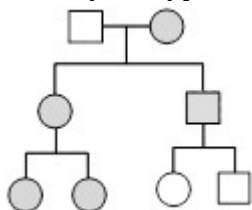
652. Which of the following is generally used for induced mutagenesis in crop plants?

- a) Alpha particles b) X-rays
c) UV (260nm) d) Gamma rays (from cobalt 60)

653. Genetic recombination is due to

- a) Fertilization and meiosis b) Mitosis and meiosis
c) Fertilization and mitosis d) None of the above

654. Identify the type of inheritance in the given diagram



- a) Dominant X-linked b) Recessive X-linked
c) Dominant Y-linked d) Cytoplasmic or mitochondrial inheritance

655. Linkage gene do not shows

- a) Independent assortment b) 9 : 3 : 3 : 1
c) Segregation d) All of the above

656. Haploids are more suitable for mutation studies than the diploids. This is because

- a) Haploids are reproductively more stable than diploids
b) Mutagens penetrate in haploids more effectively than in diploids
c) Haploids are more abundant in nature than diploids
d) All mutations whether dominant or recessive are expressed in haploids

657. Mendel's work remain unrecognized for long time due to

- I. Communication was not easy
II. Concept of factors which did not blend was not accepted
III. Use of mathematics to explain biological problem was unacceptable
IV. He could not provide any physical proof for the existence of factors

Choose the right combination

- a) I and II b) II and III c) III and IV d) All of these

658. Ratio of progeny, when a red coloured heterozygote is crossed with a white coloured plant in which red colour is dominant to white colour

- a) 3 : 1 b) 1 : 1 c) 1 : 2 : 1 d) 9 : 3 : 3 : 1

659. Mendel self-pollinated the F_2 -plant and found that ...A...plants continued to generate dwarf plant in ...B... and C... generations. He concluded that the genotype of the dwarfs is ...D....

Choose the correct option for A,B,C and D

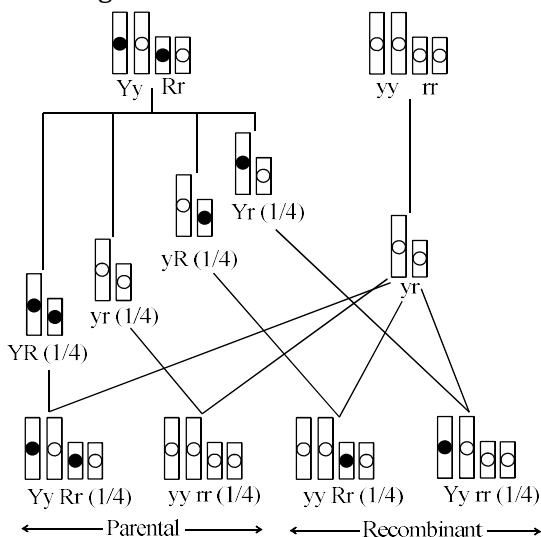
- a) A-dwarf, B-F₃, C-F₄, D-homozygous b) A-dwarf, B-F₃, C-F₄, D-heterozygous
c) A-tall, B-F₅, C-F₆, D-homozygous d) A-tall, B-F₅, C-F₆, D-heterozygous
660. The possibility of erythroblastosis foetalis occurring during the second pregnancy is when
a) The baby is Rh⁺ and mother Rh⁻ b) The baby and mother are Rh⁺
c) The baby and mother are Rh⁻ d) The baby is Rh⁻ and mother Rh⁺
661. I. Enborn error of metabolism
II. Homozygous recessive autosomal alleles on chromosomes 12 causes absence of the specific enzyme
III. A specific amino acid do not changes into tyrosine
IV. Accumulation of phenylpyruvic acid and other derivatives leading to mental retardation
The above facts refer to
a) Muscular dystrophy b) Phenylketonuria
c) Turner's syndrome d) Down's syndrome
662. How many phenotype and genotypes are possible in ABO blood group systems?
a) Four, five b) Four, six c) Four, seven d) Three, four
663. Lack of independent assortment of two genes-A and B in fruit fly-*Drosophila* is due to
a) Repulsion b) Recombination c) Linkage d) Crossing over
664. Mendel was successful in discovering the principles of inheritance as
a) He took pea plants for his experiments b) He did not encounter linkage between the genes for the characters he considered
c) He had an in-depth knowledge on hybridization d) He was a famous mathematician
665. The common point of attachment of all the arms of polytene chromosome, is known as
a) Centromere b) Chromomere c) Chromocentre d) centrosomes
666. Choose the correct option for allotetraploid
a) AABB b) AAAA c) AAABBB d) BBBB
667. Mutation is more common when it is present in
a) Recessive condition b) Dominant condition
c) Constant in population d) None of these
668. Allelism refers to
a) genic interactions controlling a character b) Multiple genes controlling a character
c) Expression of many characters by a single gene d) Alternative forms of a gene at a given locus
669. Which one pair of parents is most likely get a child, who would suffer from haemolytic disease of new born?
a) Rh⁺ mother and Rh⁻ father b) Rh⁻ mother and Rh⁻ father
c) Rh⁺ mother and Rh⁺ father d) Rh⁻ mother and Rh⁺ father
670. Mendel performed test cross to know the
a) Genotype of F₁ b) Genotype of F₂ c) Genotype of F₃ d) Genotype of F₄
671. Change in single base pair
a) May not change the phenotype b) Quickly changed the phenotype
c) Change the natural process d) None of the above
672. Find out the correct statement.
a) Monosomy and nullisomy are the two types of euploidy
b) Polyploidy is more common in animals than in plants
c) Polyploids occur due to the failure in complete separation of sets of chromosomes
d) 2n-1 condition results in trisomy
673. In phenylketonuria, the phenylalanine gets converted to
a) Acetic acid b) Phenyl acetic acid c) Phenyl pyruvic acid d) Pyruvic acid
674. Which one of the following is a genetically transmitted character?

- a) Colourblindness b) Hydrocephalus c) Haemophilia d) All of these

675. Identify the correct choice for given symbols (A and B)



- a) A-consanguineous mating; B-mating b) A-mating; B-mating between relatives
c) A-mating; B-consanguineous mating d) Both (b) and (c)
676. F_1 -hybrid is intermediate between the two parents. The phenomenon is
a) Codominance b) Dominance
c) Blending inheritance d) Incomplete dominance
677. Multiple phenotype seen in
a) Pleiotropy b) Incomplete dominance
c) Multiple allelism d) Polygenic inheritance
678. After a mutation at a genetic locus character of an organism changes due to the change in
a) Protein structure b) DNA replication
c) Protein synthesis pattern d) RNA transcription pattern
679. In XX and XY type of sex determination, the males are
a) Homogametic b) Heterogametic c) Both (a) and (b) d) Isogametic
680. Dihybrid ratio of test cross 1 : 1 : 1 : 1 proves that
a) F_1 hybrid produces four different progenies b) F_1 hybrid produces two different progenies
c) Parents produce two different progenies d) None of the above
681. A homozygous sweet pea plant with blue flowers (RR) and long pollen (R_0R_0) is crossed with a homozygous plant having red flowers (rr) and round pollen (r_0r_0). The resultant F_1 hybrid is test crossed. Which of the following genotype does not appear in its progeny?
a) $\frac{1}{4}$ b) $\frac{1}{8}$ c) $\frac{1}{16}$ d) $\frac{3}{16}$
682. Mendel's findings were rediscovered by
a) De Vries b) Correns c) Tschermak d) All of these
683. The salivary gland chromosomes in the dipteran larvae are useful in gene mapping because
a) These are much longer in size b) These are easy to stain
c) These are fused d) They have endoreduplicated chromosomes
684. Percentage of recessive phenotype in a cross between PP and Pp, when P is dominant, p recessive
a) 25% b) 50% c) 35% d) 100%
685. Genes are made up of
a) Histones b) Hydrocarbons c) Polynucleotides d) Lipoproteins
686. The diagram indicates



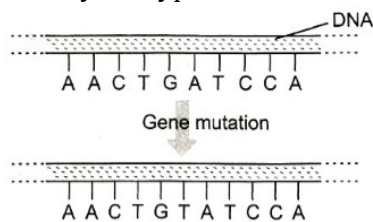
- a) Test cross of monohybrid b) Test cross of dihybrid
c) Back cross of dihybrid d) Back cross of monohybrid

687. Type of substitution takes place in sickle-cell anaemia is
 a) Acidic amino acid to an neutral amino acid b) Glutamic acid by valine
 c) GUG to GAG d) All of the above
688. In the hexaploid wheat, the haploid (n) and basic (x) numbers of chromosomes are
 a) $n=7$ and $x=21$ b) $n=21$ and $x=21$ c) $n=21$ and $x=14$ d) $n=21$ and $x=7$
689. Persons who are colourblind can not distinguish
 a) Red and green colour b) Yellow and white colour
 c) Black and white colour d) Yellow and blue colour
690. Haploid-diploid mechanism of sex determination (haplodiploidy) takes place in
 a) Bees b) Wasps c) Ants d) All of these
691. Sickle-cell anaemia happens due to ...A... mutation in which ...B... of haemoglobin is affected.
 Fill the correct option for A and B
 a) A-point; B- β -chain b) A-chromosomal; B- α -chain
 c) A-allele; B- α -chain d) A-non-allele; B-chain
692. The gene of sickle cell anaemia is inherited by
 a) Blood cells b) Bone cells c) Sex chromosomes d) autosomes
693. A character, which is expressed in a hybrid is called
 a) Dominant b) Recessive c) Codominant d) epistatic
694. The first definite proof of mutagenic action of X-rays was given by
 a) Muller b) Hooker c) Lister d) Leeuwenhoek
695. If the genotype of an individual consists of only one type of genes at same locus. It is called
 a) Homozygous b) Heterozygous c) Monoallelic d) Uniallelic
696. The nucleoprotein structures that occur at the ends of the chromosomes are
 a) Centrosomes b) Telomeres c) Centromeres d) Satellites
697. In polytene chromosomes dark bands are visible. These bands are formed by the position of
 a) Protein particles b) Chromomeres on chromonemata
 c) Nucleosomes d) None of the above
698. Chances of segregation of alleles in gametes are
 a) 25% b) 35% c) 50% d) 75%
699. In *Drosophila*, gene for white eye mutation is also responsible for depigmentation of body parts. Thus, a gene that controls several phenotypes is called
 a) Oncogene b) Epistatic gene c) Hypostatic gene d) Pleiotropic gene
700. Hypertrichosis is an example of which inheritance?
 a) Holandric b) Incomplete sex-linked
 c) Sex -influenced d) Sex -limited
701. The mutagenic agent among following is
 a) Ethyl methane b) Ethylene c) 2, 4-D d) IAA
702. The most important example of point mutation is found in a disease called
 a) Thalassaemia b) Night blindness c) Down's syndrome d) Sickle-cell anaemia
703. When tall and dwarf plants are crossed, from which cross 1 : 1 ratio is obtained?
 a) Tt and tt b) tt and tt c) Tt and Tt d) TT and Tt
704. Failure of segregation of chromatid during cell division cycle results in the gain or loss of chromosome which is called
 a) Aneuploidy b) Hypopolyploidy c) Hyperpolyploidy d) Polyploidy
705. Genes are present on
 a) Chromosomes b) Lamellae c) Plasma membrane d) mesosomes
706. Out of 7 contrasting trait pairs selected by Mendel how many traits were dominant and recessive?
 a) 7 and 7 b) 8 and 6 c) 6 and 8 d) 5 and 9
707. Example of environmental determination of sex is/are
 a) Alligators b) Turtles c) *Bonellia* d) All of these
708. Dominant allele are expressed in

- a) Second generation
c) Heterozygous condition
b) Homozygous condition
d) Both (b) and (c)
709. If the ratio between X-chromosomes and complete set of autosome is 0.5. Then the individual will be
a) Female
b) Superfemale
c) Male
d) Supermale
710. When a tall plant with rounded seeds (TTRR) is crossed with a dwarf plant with wrinkled seeds (ttrr), the F_1 -generation consists of tall plants with rounded seeds. How many types of gametes, an F_1 -plant would produce?
a) One
b) Three
c) Four
d)
711. The leaf colour of certain plants is controlled by one gene. For that gene, the allele G = orange and g = green. You have a plant with orange leaves, but do not know whether that plant's genotype is GG or Gg. If you cross your unknown plant with one of the plants whose genotype is listed below, you will be able to determine your unknown's genotype. With which plant would you cross it?
a) GG
b) Gg
c) Gg
d) Either of parents
712. Which of the following discoveries resulted in a Nobel Prize?
a) Recombination of linked genes
b) Genetic engineering
c) X-rays induce sex-linked recessive lethal mutations
d) Cytoplasmic inheritance
713. A boy has a normal brother and a colourblind sister. What is true about his parents?
a) His father was normal but mother was colourblind
b) His father was colourblind but mother was carrier
c) Both father and mother were colourblind
d) Both father and mother were normal
714. By seeing the ratio of F_1 and F_2 -generation Mendel proposed that something was stably passed down unchanged over successive generation and called this something as
a) Alleles
b) Genes
c) Chromosomes
d) Factors
715. Extranuclear inheritance is a consequence of presence of genes in
a) Mitochondria and chloroplasts
b) Endoplasmic reticulum and mitochondria
c) Ribosomes and chloroplast
d) Lysosomes and ribosomes
716. The F_2 genotypic ratio of monohybrid cross is
a) 0%
b) 25%
c) 50%
d) 100%
717. Colour blindness is due to defect in
a) Cones
b) Rods
c) Rods and cones
d) Rhodopsin
718. In F_2 -generation, quantitative inheritance 1 : 4 : 6 : 4 : 1 is obtained instead of
a) 9 : 3 : 3 : 1
b) 8 : 6 : 4 : 1
c) 7 : 4 : 1 : 4
d) 6 : 6 : 4 : 7
719. Leaf colour in *Mirabilis jalapa* is an example of
a) Non-Mendelian inheritance
b) Mendelian inheritance
c) Chemical inheritance
d) Both (b) and (c)
720. I. Trisomy of sex (X) chromosome
II. XXY+44
III. 21st trisomy
IV. Sterile male
V. Gynaecomastia
Choose the correct option for Klinefelter's syndrome
a) I, II, III and IV
b) I, II, IV and V
c) II, III, IV and V
d) I, III, IV and V
721. Consider the following statement regarding ABO blood group in human
I. It is controlled by multiple allele
II. It shows codominance
III. Codominance can be manifested phenotypically in human
IV. It follows the Mendel law of inheritance
Which of the following statements (s) are correct?
a) Only I is correct
b) I and II are correct
c) II and III are correct
d) IV and II are correct

722. Brachydactyly is due to
 a) Dominant gene on the autosome
 b) Recessive gene on the autosome
 c) Dominant gene on the sex chromosome
 d) None of the above
723. Which of the following chromosomal formulation is responsible for the expression of meta-male character in *Drosophila*?
 a) $2A+3X$
 b) $3A+3X$
 c) $4A+3X$
 d) $3A+XY$
724. When there are more than two allele controlling the same character. These are called
 a) Many alleles
 b) Polyalleles
 c) Multiple alleles
 d) All of these
725. Monohybrid cross deals with
 a) One character
 b) Two character
 c) Three characters
 d) Four characters
726. X-chromosomes of female, in a case of sex-linked inheritance, can be passed on to
 a) Only female progeny
 b) Only male progeny
 c) Only in grand daughter
 d) Male and female progeny

727. Identify the type of mutation in given diagram



- a) Inversion
 b) Insertion
 c) Deletion
 d) Substitution
728. The recessive parental trait is expressed without any blending in the F_2 -generation, we can infer. That F_1 -plants produce gamete by the process of ...A... and allele of parental pair separate ...B... from each other and only one gamete is transmitted a gamete. Here A and B are
 a) A-mitosis; B-aggregate
 b) A-meiosis; B-segregate
 c) A-meiosis; B-aggregate
 d) A-mitosis; B-segregate
729. If a cross between two individuals produces offspring with 50% dominant character (A) and 50% recessive character (a), then the genotypes of parents are
 a) Sex linked alleles
 b) Asexually reproducing forms
 c) Sexually interbreeding forms
 d) Diploid homozygous forms
730. The similar and dissimilar sex chromosomes of females and males are described as
 a) Hormomorphic
 b) Heteromorphic
 c) Both (a) and (b)
 d) Isomorphic
731. Starch synthesis gene in pea plant in heterozygous condition produces starch grain of intermediate size. This shows
 a) Complete dominance
 b) Incomplete dominance
 c) Codominant
 d) Dominant
732. Select the correct bases of DNA, RNA and amino acid of beta chain resulting in sickle cell anaemia.
- | DNA | RNA | Amino Acid |
|------------|-----|---------------|
| a) CTC/GAG | GUG | Glutamic acid |
| b) CAC/GAG | GUG | Valine |
| c) CAC/GTC | GAG | Valine |
| d) CTC/GAG | GUG | Valine |

1)	b	2)	a	3)	c	4)	a	201)	b	202)	a	203)	d	204)	c
5)	c	6)	d	7)	a	8)	b	205)	a	206)	d	207)	d	208)	b
9)	a	10)	b	11)	d	12)	a	209)	a	210)	a	211)	c	212)	d
13)	d	14)	c	15)	a	16)	a	213)	a	214)	d	215)	a	216)	c
17)	c	18)	a	19)	d	20)	c	217)	a	218)	b	219)	a	220)	b
21)	c	22)	a	23)	a	24)	d	221)	c	222)	d	223)	a	224)	a
25)	a	26)	b	27)	c	28)	a	225)	a	226)	b	227)	b	228)	a
29)	c	30)	c	31)	c	32)	c	229)	a	230)	c	231)	d	232)	c
33)	a	34)	c	35)	c	36)	b	233)	d	234)	d	235)	d	236)	a
37)	b	38)	d	39)	a	40)	d	237)	b	238)	c	239)	b	240)	a
41)	d	42)	a	43)	c	44)	a	241)	a	242)	a	243)	a	244)	b
45)	b	46)	b	47)	b	48)	a	245)	a	246)	d	247)	a	248)	a
49)	d	50)	c	51)	a	52)	a	249)	d	250)	d	251)	b	252)	a
53)	a	54)	d	55)	b	56)	c	253)	b	254)	a	255)	b	256)	b
57)	a	58)	a	59)	a	60)	a	257)	b	258)	a	259)	a	260)	d
61)	d	62)	b	63)	c	64)	d	261)	b	262)	a	263)	d	264)	c
65)	c	66)	c	67)	b	68)	d	265)	b	266)	d	267)	b	268)	b
69)	c	70)	d	71)	c	72)	d	269)	b	270)	a	271)	c	272)	b
73)	d	74)	c	75)	c	76)	d	273)	b	274)	a	275)	b	276)	d
77)	a	78)	a	79)	a	80)	c	277)	b	278)	b	279)	b	280)	b
81)	c	82)	b	83)	b	84)	a	281)	a	282)	a	283)	a	284)	a
85)	d	86)	a	87)	a	88)	c	285)	b	286)	c	287)	d	288)	d
89)	c	90)	c	91)	a	92)	d	289)	a	290)	a	291)	b	292)	c
93)	a	94)	a	95)	d	96)	a	293)	b	294)	a	295)	a	296)	b
97)	d	98)	c	99)	c	100)	c	297)	c	298)	c	299)	a	300)	b
101)	c	102)	b	103)	c	104)	c	301)	b	302)	d	303)	d	304)	b
105)	c	106)	a	107)	a	108)	b	305)	b	306)	b	307)	c	308)	c
109)	d	110)	a	111)	c	112)	c	309)	b	310)	a	311)	b	312)	b
113)	a	114)	d	115)	d	116)	a	313)	a	314)	d	315)	a	316)	d
117)	b	118)	c	119)	a	120)	d	317)	c	318)	a	319)	c	320)	b
121)	a	122)	a	123)	b	124)	b	321)	b	322)	d	323)	b	324)	b
125)	c	126)	a	127)	c	128)	b	325)	b	326)	c	327)	d	328)	a
129)	d	130)	c	131)	a	132)	c	329)	a	330)	c	331)	a	332)	a
133)	b	134)	d	135)	d	136)	b	333)	a	334)	a	335)	b	336)	a
137)	c	138)	d	139)	c	140)	d	337)	a	338)	d	339)	d	340)	a
141)	a	142)	b	143)	a	144)	c	341)	c	342)	b	343)	a	344)	a
145)	b	146)	b	147)	a	148)	a	345)	a	346)	d	347)	b	348)	b
149)	c	150)	d	151)	a	152)	a	349)	b	350)	d	351)	b	352)	a
153)	c	154)	d	155)	a	156)	a	353)	a	354)	c	355)	d	356)	a
157)	a	158)	c	159)	a	160)	c	357)	a	358)	b	359)	c	360)	c
161)	c	162)	c	163)	d	164)	c	361)	c	362)	b	363)	d	364)	b
165)	c	166)	c	167)	c	168)	b	365)	c	366)	c	367)	a	368)	a
169)	c	170)	c	171)	c	172)	c	369)	d	370)	a	371)	a	372)	a
173)	b	174)	b	175)	a	176)	a	373)	b	374)	a	375)	d	376)	d
177)	b	178)	c	179)	d	180)	b	377)	a	378)	a	379)	b	380)	b
181)	a	182)	b	183)	d	184)	b	381)	a	382)	a	383)	a	384)	b
185)	b	186)	b	187)	a	188)	a	385)	c	386)	c	387)	a	388)	b
189)	a	190)	a	191)	c	192)	d	389)	b	390)	b	391)	d	392)	a
193)	c	194)	c	195)	d	196)	c	393)	c	394)	a	395)	a	396)	c
197)	d	198)	a	199)	b	200)	a	397)	b	398)	b	399)	c	400)	b

401)	a	402)	b	403)	b	404)	d	605)	a	606)	b	607)	b	608)	c
405)	a	406)	a	407)	b	408)	d	609)	b	610)	a	611)	a	612)	a
409)	b	410)	c	411)	a	412)	d	613)	a	614)	b	615)	c	616)	c
413)	d	414)	b	415)	a	416)	b	617)	c	618)	a	619)	c	620)	a
417)	a	418)	a	419)	a	420)	c	621)	c	622)	b	623)	c	624)	a
421)	a	422)	c	423)	b	424)	d	625)	c	626)	d	627)	a	628)	c
425)	c	426)	c	427)	b	428)	b	629)	c	630)	c	631)	a	632)	c
429)	a	430)	b	431)	b	432)	d	633)	b	634)	c	635)	b	636)	d
433)	c	434)	c	435)	d	436)	c	637)	d	638)	d	639)	b	640)	d
437)	a	438)	a	439)	c	440)	b	641)	a	642)	c	643)	a	644)	b
441)	d	442)	d	443)	b	444)	d	645)	c	646)	a	647)	b	648)	a
445)	c	446)	d	447)	b	448)	c	649)	a	650)	b	651)	a	652)	d
449)	a	450)	c	451)	b	452)	a	653)	a	654)	d	655)	d	656)	d
453)	b	454)	b	455)	a	456)	b	657)	d	658)	b	659)	a	660)	a
457)	c	458)	b	459)	c	460)	c	661)	b	662)	b	663)	c	664)	b
461)	b	462)	c	463)	c	464)	a	665)	c	666)	a	667)	b	668)	d
465)	d	466)	d	467)	a	468)	b	669)	d	670)	b	671)	a	672)	c
469)	b	470)	d	471)	d	472)	c	673)	c	674)	d	675)	d	676)	d
473)	c	474)	a	475)	b	476)	c	677)	d	678)	a	679)	b	680)	a
477)	c	478)	d	479)	b	480)	b	681)	a	682)	d	683)	d	684)	b
481)	a	482)	a	483)	b	484)	b	685)	c	686)	b	687)	d	688)	d
485)	a	486)	d	487)	b	488)	a	689)	b	690)	d	691)	a	692)	d
489)	d	490)	d	491)	d	492)	d	693)	a	694)	a	695)	a	696)	b
493)	c	494)	a	495)	a	496)	c	697)	b	698)	c	699)	d	700)	a
497)	a	498)	a	499)	a	500)	c	701)	a	702)	d	703)	a	704)	a
501)	a	502)	a	503)	b	504)	a	705)	a	706)	a	707)	d	708)	d
505)	a	506)	a	507)	b	508)	a	709)	c	710)	d	711)	b	712)	c
509)	d	510)	b	511)	d	512)	a	713)	b	714)	d	715)	a	716)	c
513)	a	514)	c	515)	b	516)	a	717)	a	718)	a	719)	a	720)	b
517)	c	518)	a	519)	b	520)	c	721)	b	722)	c	723)	b	724)	c
521)	d	522)	c	523)	b	524)	a	725)	a	726)	d	727)	b	728)	b
525)	c	526)	d	527)	a	528)	b	729)	b	730)	c	731)	b	732)	b
529)	c	530)	c	531)	d	532)	d								
533)	c	534)	c	535)	a	536)	b								
537)	b	538)	a	539)	c	540)	b								
541)	a	542)	a	543)	a	544)	d								
545)	a	546)	c	547)	a	548)	c								
549)	d	550)	c	551)	d	552)	a								
553)	b	554)	c	555)	b	556)	d								
557)	c	558)	a	559)	b	560)	b								
561)	a	562)	d	563)	c	564)	d								
565)	a	566)	a	567)	d	568)	a								
569)	d	570)	d	571)	b	572)	d								
573)	c	574)	b	575)	b	576)	b								
577)	d	578)	c	579)	b	580)	d								
581)	c	582)	b	583)	c	584)	d								
585)	a	586)	a	587)	d	588)	a								
589)	d	590)	c	591)	d	592)	c								
593)	a	594)	b	595)	b	596)	a								
597)	c	598)	b	599)	d	600)	c								
601)	d	602)	d	603)	c	604)	c								

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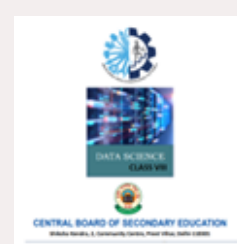
Mass Media - Being Media Literate



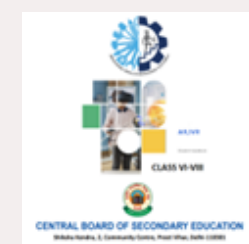
Travel & Tourism



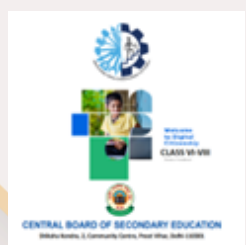
Coding



Data Science (Class VIII only)



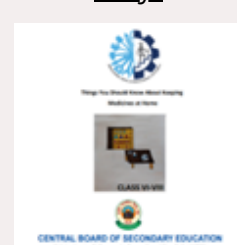
Augmented Reality / Virtual Reality



Digital Citizenship



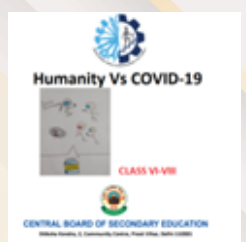
Life Cycle of Medicine & Vaccine



Things you should know about keeping Medicines at home



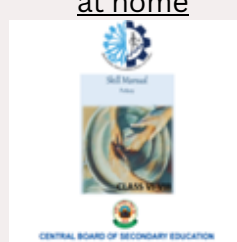
What to do when Doctor is not around



Humanity & Covid-19



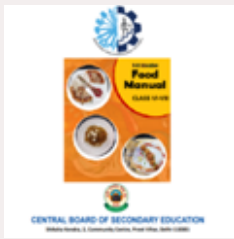
Blue Pottery



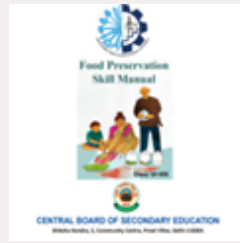
Pottery



Block Printing



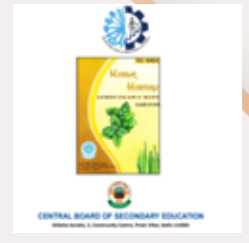
Food



Food Preservation



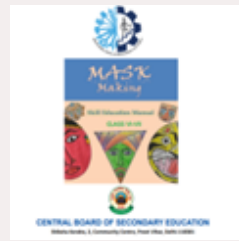
Baking



Herbal Heritage



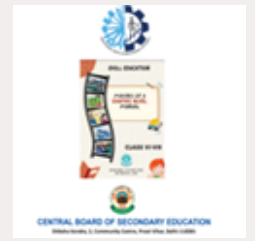
Khadi



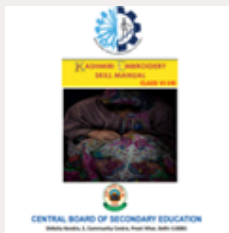
Mask Making



Mass Media



Making of a Graphic Novel



Kashmiri Embroidery



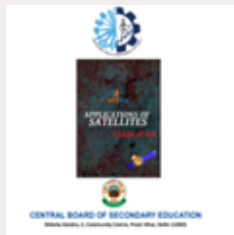
Embroidery



Rockets



Satellites

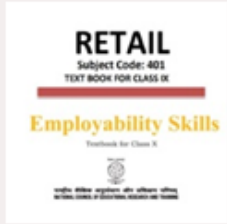


Application of Satellites

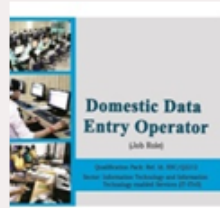


Photography

SKILL SUBJECTS AT SECONDARY LEVEL (CLASSES IX – X)



Retail



Information Technology



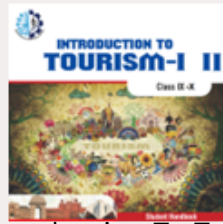
Security



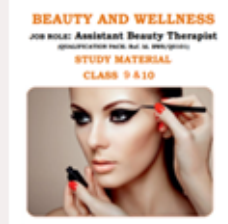
Automotive



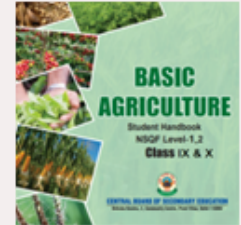
Introduction To Financial Markets



Introduction To Tourism



Beauty & Wellness



Agriculture



Food Production



Front Office Operations



Banking & Insurance



Marketing & Sales



Health Care



Apparel



Multi Media



Multi Skill Foundation Course



Artificial Intelligence



Physical Activity Trainer



Data Science



Electronics & Hardware (NEW)

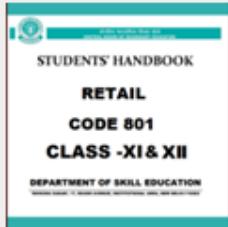


Foundation Skills For Sciences (Pharmaceutical & Biotechnology)(NEW)

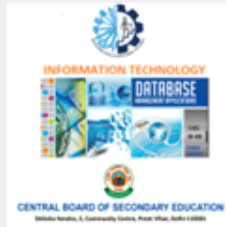


Design Thinking & Innovation (NEW)

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Retail



Information Technology



Web Application



Automotive



Financial Markets Management



Tourism



Beauty & Wellness



Agriculture



Food Production



Front Office Operations



Banking



Marketing



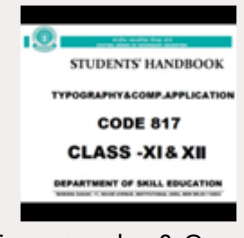
Health Care



Insurance



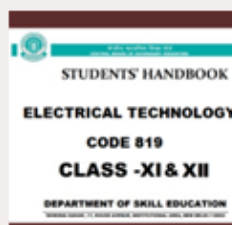
Horticulture



Typography & Comp.
Application



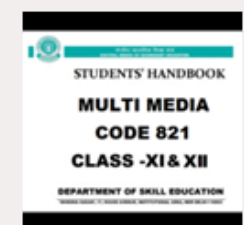
Geospatial Technology



Electrical Technology



Electronic Technology



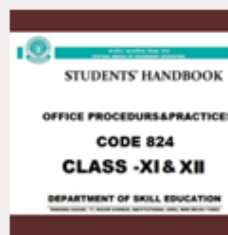
Multi-Media



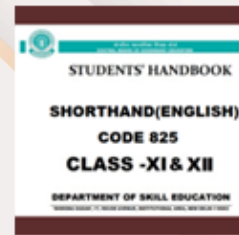
Taxation



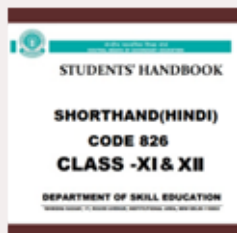
Cost Accounting



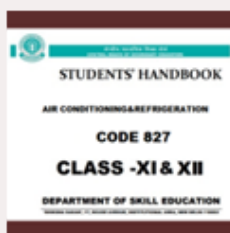
Office Procedures & Practices



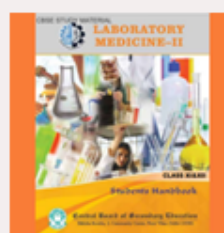
Shorthand (English)



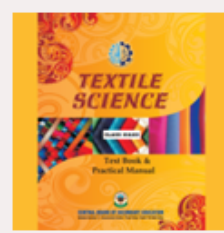
Shorthand (Hindi)



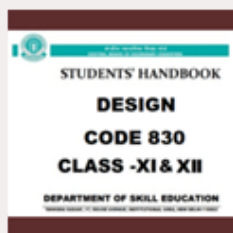
Air-Conditioning & Refrigeration



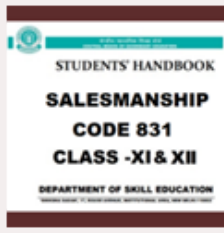
Medical Diagnostics



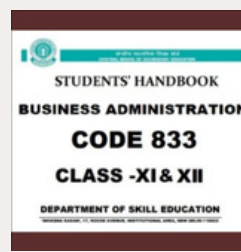
Textile Design



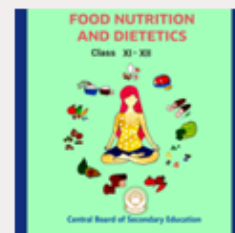
Design



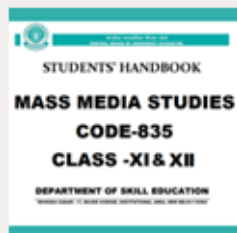
Salesmanship



Business Administration



Food Nutrition & Dietetics



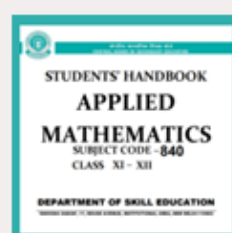
Mass Media Studies



Library & Information Science



Fashion Studies



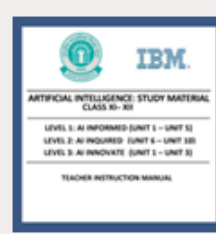
Applied Mathematics



Yoga



Early Childhood Care & Education



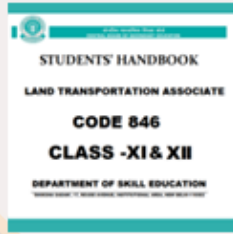
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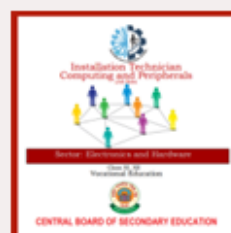
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Physical Activity Trainer(new)



Land Transportation Associate (NEW)



Electronics & Hardware (NEW)



Design Thinking & Innovation (NEW)

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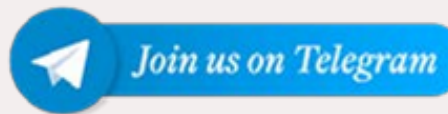
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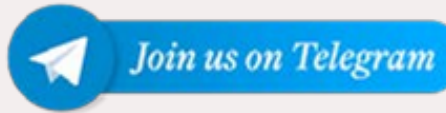
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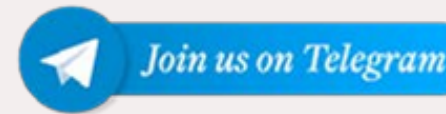
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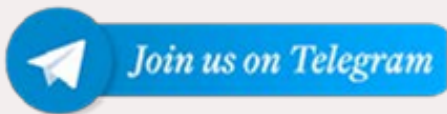
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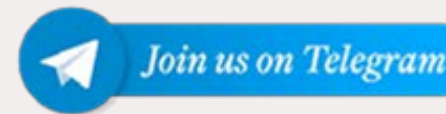
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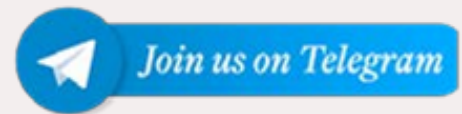
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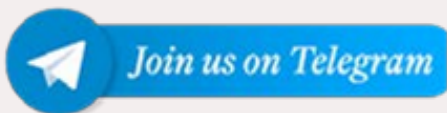
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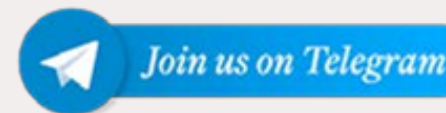
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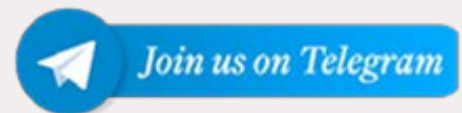
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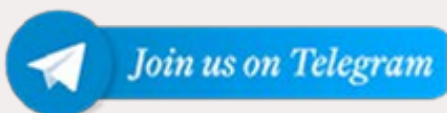
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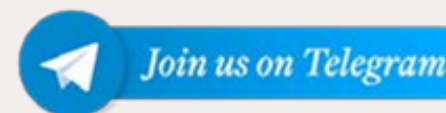
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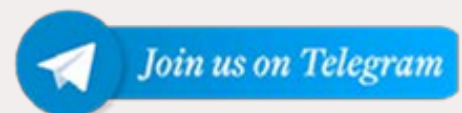
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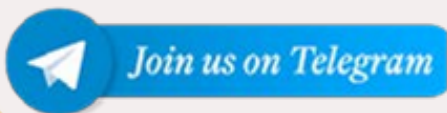
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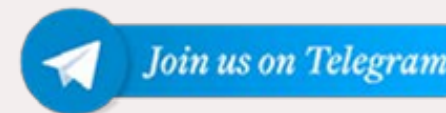
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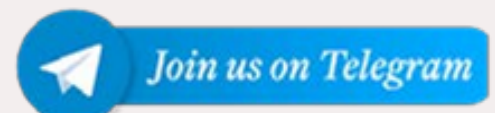
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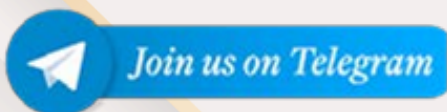
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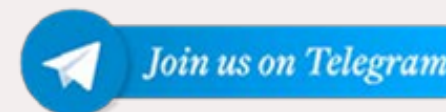
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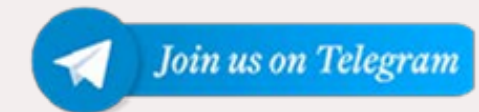
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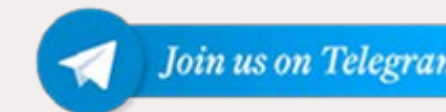
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